THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888

No. 7. FEBRUARY 14, 1953 VOL. 65.

BRUCELLA INFECTIONS IN MAN AND ANIMALS IN GREAT BRITAIN: EPIDEMIOLOGY AND THE FUTURE*

BY

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It is a particular pleasure to me to address this meeting because, as some of you know, I have been working for more than 20 years to establish a closer liaison between the medical and veterinary professions, and it was through my interest in brucella infection in man that I first made contact with the veterinary profession in which I am now proud to count so many friends.

Brucellosis is a very big subject, and I have therefore thought it best to confine myself to two aspects only, epidemiology and the future of brucella infection in this country.

EPIDEMIOLOGY

ANIMALS

The only animals in this country which are known to suffer from brucella infection are bovines and occasionally horses, but in other countries goats, sheep, swine, horses, buffaloes, dogs, cats, rabbits and hares all suffer in this way. Bovine infection in Britain is always with *Brucella abortus*, with one exception, a very curious strain of *Br. melitensis* which has been detected in herds in a number of counties since 1940, but which has never, so far as is known, given rise to cases of human undulant fever. Aberrant strains of this kind, sometimes resembling one variety of brucella and sometimes another, have been reported from other countries as well, and I shall refer to them again later.

Br. abortus infection of cattle (known as contagious abortion) has been a very serious problem in Britain and until large-scale vaccination of young animals with an attenuated live vaccine was instituted it was a greater cause of financial loss to the dairying industry than any other disease, tuberculosis included, bringing with it abortion and sterility. Infected cows do not always abort, but brucellae are discharged in large numbers, either on abortion or during normal parturition, in the liquor amnii and the foetal membranes. At the first introduction of the infection into a herd abortions occur usually only at long intervals and at this stage the infection often remains undetected for a considerable time. But whilst this is going on many apparently healthy animals are producing infected milk and so, perhaps, giving rise to cases of human undulant fever. Infection is spread in the herd by contamination of byres, straw, fodder and drinking water and the contamination of pastures is also probably important, as the organisms are capable of surviving for a long time in such pastures even when exposed to the weather. A minor part in the spread of infection is also played by infected bulls. Calves born of infected mothers are usually immune for a time, but on the approach of sexual maturity they also become susceptible.

The first part of the animal's body to harbour infection is the lymph glands, from which invasion of the blood stream often occurs periodically, and from the blood the infection spreads to the liver, spleen, diaphragm and thyroid gland—the joints, tendon sheaths and bursae being occasionally invaded also. Such invasion is usually transitory, however, and from the medical standpoint the real danger arises from infection of the udder and associated lymph glands. Occult infection, without any detectable pathological changes, is common and results in infection being often well established before its presence is detected. This danger is increased by the fact that even when abortion occurs the cow is often apparently healthy and with each succeeding pregnancy the tendency to abort becomes weaker as partial immunity is acquired. Here a well-known epidemiological phenomenon is manifested, for introduction of new susceptible animals into the herd results in a heightening of the virulence of the infecting organisms and an increase in abortions.

As regards excretion of brucella in the milk, it is important to remember, firstly, that such excretion though very persistent is nevertheless irregular and intermittent, and secondly, that though brucella infection is often co-existent with tuberculosis it often occurs in tubercle-free herds, so that the multiplication of such herds though most desirable is not in itself a protection against human undulant fever—a fact which, as is shown from recent correspondence in the Press, is not yet grasped even by otherwise intelligent people. Thus in my series of 1,134 cases of the human disease the only milk consumed by the patients was "tuberculin tested" in 64 instances and "certified" in 10 more cases.

Although, as I have mentioned, brucella infection in this country has so far been found only in bovines (apart from *Homo sapiens*) the possibility of its occurrence in other species, and especially in rodents, deserves careful consideration. After all, brucella infection of hares was first detected in Germany as late as 1941 and in Switzerland in 1946, and the Brucella Committee of the Agricultural Research Council on which I served, when investigating over a period of eight years the possibility of eradicating contagious abortion of cattle by the creation of brucella-free herds on the basis of the agglutination test, found that however carefully this was done and the herd protected from outside infection by elaborate precautions, infection was nearly always re-introduced in two years or less. Though the reason for this failure remained obscure I have always felt that the agency of small animals or birds—either infected themselves or acting perhaps purely mechanically as is now suggested in the case of foot-and-mouth disease—afforded the most probable explanation.

MAN

The epidemiology of brucella infection in man (usually referred to nowadays as "human brucellosis," though I prefer the name "undulant fever" given to it by Hughes in 1897) is in some ways simple so far as our own country is concerned, as the only known source of infection is cattle

* Address to Joint Meeting of Brighton Branch, British Medical Association, and Sussex Division, British Veterinary Association, October 30th, 1952.

and, apart from laboratory infections, it is transmitted either by ingestion of infected milk or by direct contact with infected animals, their carcases or discharges. Of these sources milk is by far the commonest, though here again, in spite of 23 years of propaganda by myself and others, I still encounter individuals who are unwilling to accept the causal connection between the milk of infected cows and the occurrence of undulant fever, it usually being argued that if this were true many more human cases would occur. Let me therefore examine this contention.

First of all, then, these people assume that the human disease is uncommon here, which I gravely doubt. It is true that in the absence of compulsory notification no reliable figure can be given for incidence and that most *public health* laboratories when sent blood for agglutination testing in cases suspected of infection with organisms of the enteric group put it up also against brucella suspensions. But

1. By taking the annual notifications of typhoid fever and applying the reduction factor given by the relative frequency of agglutination of *S. typhi* and *Br. abortus* by sera submitted for routine Widal reactions, an annual incidence of undulant fever of 400 to 500 cases is obtained ;

2. Very mild cases certainly occur in which no agglutination test may be done, a diagnosis of " feverish cold," " influenza," etc., being made, or in which fever may be absent during the whole course of the illness, as reported by myself, Debono, Löffler and others ;

3. A single agglutination test is far too often accepted as definitely excluding this disease, though agglutinins can never be found earlier than five days after the onset and often take much longer to appear, negative agglutination zones (usually called " pro-zones ") are very common, and occasionally no brucella agglutinins can be detected throughout the illness in spite of repeated testing, even when the organism is eventually grown from the blood, sternal marrow, etc. ;

4. Culture from blood, urine, sternal marrow, lymph glands, etc., is far too seldom attempted, and even when tried the technique is still often faulty, especially as regards the duration of culture of this very slow growing organism. (The FAO/WHO Expert Committee on Brucellosis, over which I presided, recommended that cultures should be kept at least 35 days before discarding.)

But even if the incidence of undulant fever is a good deal higher than most people imagine one must admit that only a small proportion of the consumers of an infected milk supply contract the disease ; the reason for this is obscure, though I believe that an important factor here is probably the ease with which brucella is destroyed by the dilute hydrochloric acid of the gastric juice.

But what is the evidence for human infection with brucella from cows' milk in this country ?

TABLE I
EVIDENCE OF INFECTION FROM MILK IN 780 CASES

Drank raw milk or cream	Contagious abortion reported present	Milk whey agglutinated brucella	Brucella grown from milk	Cow's blood-serum agglutinated brucella	Brucella grown from cow's blood
780 *	217	44	38	22	1

* This number includes 64 cases in which tuberculin-tested milk was drunk and 10 cases in which certified milk was drunk ; 82 of these 780 patients had also had contact with infected animals.

Of the 1,134 cases of undulant fever in my series 780 patients were known to have consumed milk or cream which had not been boiled or pasteurised. Of these 780 cases, however, 82 had been in contact with animals suffering from contagious abortion, leaving 698 patients without such contact—or 694 if allowance is made for four cases in which infection was almost certainly due to accidental injection of, or contamination with, Strain 19 live vaccine during immunisation of cattle. In 322 of these 694 cases there was evidence of brucella infection of the cows supplying the milk which had been drunk by the patients.

It is, I think, clear from this evidence that most cases of undulant fever in this country are due to drinking raw cows' milk infected with brucella and this is confirmed by the fact that although something like a fifth of the population of the country is concentrated in Greater London only 40 of my cases occurred there, no doubt due to some 95 per cent. of the Londoners' milk being pasteurised. So complacency about the consumption of raw cows' milk, even if it comes from a tuberculin tested herd, is very misplaced, as was illustrated by a case very early in my investigations in which a doctor's daughter of 12 contracted undulant fever from the family's raw milk supply. The doctor switched them over to a pasteurised supply, but he himself continued to drink the raw milk because he preferred the taste of it. A year later—the interval is interesting—he contracted the disease. Was this due to a temporary hypo- or a-chlorhydria ?

But, as many of you know, the incrimination of a particular milk supply is not always easy and will often require the active co-operation of the clinician, the Medical Officer of Health and the veterinary surgeon. The clinician should not regard his patient with undulant fever as merely an interesting case and a sick person to be cured, but also as a possible pointer to a source of infection which may be producing other cases, a source which it is the Medical Officer of Health's job to ferret out and investigate. And here it should be remembered that even pasteurised milk can convey infection —if it is inefficiently pasteurised—so that notification to the M.O.H. may prevent infection of milk consumers not only with brucella but also with other pathogenic micro-organisms. The veterinary surgeon can also help in the collection of milk samples from the suspected herd and the occurrence of a human case may well give him his first pointer to a herd's infection. It is only by the free co-operation of the clinician, the Medical Officer of Health and the veterinary surgeon that we can hope to rid the country of brucella infection : and the task of the M.O.H. is, in my opinion, a most difficult one, for not only must he try to find the source of infection but he must also find the right way of eliminating that source. Let me take a typical case. The clinician, the hospital laboratory, or the Public Health Laboratory reports a case of undulant fever to the Medical Officer of Health, who takes samples of the patient's milk supply for examination. The milk whey is reported a few days later to contain agglutinins for *Br. abortus* and perhaps the milk is cultured and guinea-pigs are injected. Now under Section 25 of the Food and Drugs Act, 1938, it is an offence for a person to sell, for human consumption, the milk of any cow which *to his knowledge* is suffering from contagious abortion (among other diseases), but it is unlikely that the Courts (who alone can decide this) would regard the presence of specific agglutinins in the milk as sufficient evidence of brucella infection in the cows yielding it. If, however, the organism can be grown from the milk of a particular cow (or cows) (which usually requires the help of a veterinary surgeon in taking samples—with, of course, the consent of the owner) and the producer is informed, then it becomes an offence for him to continue selling the milk from this cow (or cows). This was a pretty weak position owing to the very limited powers of sampling and the time necessary for cultural tests,

but it was considerably improved by the Milk and Dairies Regulations 1949, Section 20 of which gives power to the Medical Officer of Health of a sanitary district to stop a milk supply, or to require its efficient heat treatment before sale, if he is satisfied that any person is suffering from a disease caused by consumption of such milk, or if he has reasonable grounds for suspecting that a person is so suffering or that the milk is infected with an organism capable of causing disease in man. But suppose the M.O.H. stops such a supply, for how long is he to stop it? By the time he gets the bacteriologist's report of a positive cultural test, especially if this has been obtained only by guinea-pig inoculation, the offending cow may well have been removed from the herd as a source of danger to the other cows or as unproductive. Moreover, the M.O.H. has to beware of the compensation clauses in these regulations. In each particular case the M.O.H. has to take what seems to him the best action in all the circumstances and his local authority ought to back him up, if they think he has behaved in a reasonable manner, even if they have to pay some compensation. In practice, fortunately, the 1949 Regulations often enable the M.O.H. to persuade the farmer to have all his milk pasteurised—which, whilst not getting to the root of the infection, at any rate protects the consumers of that supply. Here it is sometimes a help to the M.O.H. to be able to point out that the patient can bring an action at common law against the dairyman and recover damages; for instance, in 1939 a bricklayer at Bexhill was awarded £195 19s. 2d. with costs at Sussex Assizes against his dairyman for supplying milk from cows suffering from contagious abortion and so causing the plaintiff to suffer from undulant fever.

My own experience suggests that most patients who claim to have drunk no milk which was not heat treated have not been infected by badly pasteurised milk but by the consumption, perhaps on a single occasion only, of raw milk or cream. I well remember in this connection one of my early cases, an old gentleman, who got his milk from one of the big combines which carry out their pasteurisation very carefully. The patient very seldom went out, but on one occasion at about the right interval before the onset of his disease he had taken tea with an old lady living nearby and I have little doubt that the raw milk in that cup (or cups) of tea was his downfall. This was by no means an isolated case.

As regards milk products, cream is usually more heavily infected than whole milk because the organisms tend to be carried up to the top by the fat globules. Butter is rarely infectious, "farm butter" being usually made from milk which has been well soured first and lactic acid kills brucella, whilst "creamery butter" is always made from pasteurised milk. Fresh cheese is sometimes a source of infection, but during the maturing process the organism is killed off. However, as was pointed out by the FAO/WHO Expert Panel on Brucellosis in the report of their first meeting in Washington in 1950, over which I presided, "*all* food products made from raw milk originating in infected herds are potentially dangerous," and this view was confirmed at our recent meeting in Florence, the need for further investigation being stressed.

Infection by direct contact occurs in a minority of cases here (though in some countries contact with infected materials accounts for 60 to 70 per cent. of human cases). Thus 159 of my cases were veterinarians, farmers or farm workers and so specially exposed to infection by this means, but of these 115 also drank raw milk, leaving only 44 cases in which infection was almost certainly due to direct contact. It is a remarkable fact that the majority of veterinarians doing cattle work never develop a definite febrile illness suggesting undulant fever, including even some of those who acquire specific arm rashes from delivering infected cows. Presumably they gradually acquire immunity to brucella from a number of sub-clinical infections, a suggestion confirmed by Axel Thomsen's finding of significant agglutinin titres in many Danish veterinary surgeons but definite undulant fever in very few. In the United States and other countries where the more virulent melitensis and suis forms of brucella occur, contact infection is of far greater importance.

The Future

There are those who believe that, in view of the success of vaccination of cattle with Strain 19 vaccine and the extension of pasteurisation of milk, contagious abortion of cattle and undulant fever of man will soon be of only historical interest in this country. I only hope they are right, but before accepting such an estimate it may be as well to re-examine the facts.

There can be no doubt that vaccination of cattle with Strain 19 is having a great success in reducing the incidence of contagious abortion—from something like 40 per cent. of the herds in the country down to about 15 per cent.—and this is very greatly to the credit of the veterinary profession. But all of us, veterinarians and doctors, know how difficult it is to get rid of the "hard core" of any infection and I cannot help feeling that with brucella this is likely to take a considerable time to accomplish. It is worth noting in this connection that a nation-wide campaign in the U.S.A. after a good start has slowed down disappointingly. Antibiotics like aureomycin, chloramphenicol and terramycin are too expensive for veterinary use at present and in any case, judging from experience of the human disease and laboratory experiments on small animals, these antibiotics cannot be relied upon to eliminate brucella infection from the body.

You may say, however, that from the human angle such a consummation is of little moment, as the campaign to extend pasteurisation of milk is rapidly gathering impetus and then we shall all be able to drink our milk without fear. No one could be more pleased than I am to see pasteurisation extending, as I have done a good deal of work in this field during the last 25 years, but I feel bound to point out the limitations of the present scheme. The Minister of Food in the exercise of his powers under the Food and Drugs (Milk, Dairies and Artificial Cream) Act of 1950 has designated nine areas in England and four areas in Scotland in which after a fixed date no milk may be sold which is not either pasteurised or sterilised, or is entirely from a tuberculin tested herd, or (until September 30th, 1954, only) is from an accredited herd. He has also expressed his intention of adding more areas as conditions as regards supplies of pasteurising plant, etc., permit. This is, of course, an important advance (delayed by the last war) in a very controversial field, but it should be noted that:—

1. The designated areas are few at present and are all large urban areas;

2. Though milk from T.T. herds is rather less likely to contain brucella than ordinary raw milk, because these herds are valuable and are therefore better cared for on the whole, yet as I have shown, many patients do in fact get their infection from T.T. milk.

Of course even if universal and efficient pasteurisation could be secured there would still be the danger of infection by direct contact with infected animals or their discharges and such a risk would not necessarily be limited to veterinarians, farmers and farm workers as at present, as will be seen from the following considerations.

There can be little doubt, I think, that the three main varieties of brucella (*viz.*, abortus, melitensis and suis)

originated from a single stock, as they resemble each other very closely indeed, and if this be accepted then what, one may ask, is there to prevent new varieties arising or the conversion of one of the existing varieties into another in any given area? Actually, as I have remarked, aberrant strains of brucella have been known for a very long time. The "para-melitensis" and "para-abortus" strains of the early days of brucella bacteriology are now regarded as merely rough strains, but forms intermediate between "melitensis" and "abortus," or between "abortus" and "suis" are constantly being isolated in both hemispheres.

Table II
Differentiation of Typical *Brucella* Strains

Brucella	CO_2 sensitivity	H_2S production			Growth in presence of		Urease test	Mono-specific sera	
		24 hours	48 hours	72 hours	B. fuchsin	Thionin		*Abortus*	*Melitensis*
Abortus ...	+	+	+	+	+	—	—	++++ 1 : 80	—
Melitensis ...	—	—	—	—	+	+	Slight after 13 minutes	—	+ 1 : 320
Suis	—	+	+	+	—	+	+ 1 minute	++ 1 : 80	+ 1 : 20

Our present criteria for differentiating between the three main varieties are the need for a raised content of carbon dioxide in the air for primary culture, the production of hydrogen sulphide by a culture in a suitable medium, the inhibition of growth by certain aniline dyes, the urease test and agglutinin absorption by mono-specific sera. Using these criteria the so-called "melitensis" strains isolated from herds in different parts of this country since 1940 behave as abortus biochemically and melitensis antigenically, whereas the aberrant strains commonly found in Southern Italy behave like abortus antigenically and melitensis biochemically. Again there is as much difference in the laboratory between the strain commonly infecting swine in Denmark and the "suis" found in the United States as there is between ordinary European melitensis and abortus strains. In this connection it is interesting to speculate on the origin of American brucella strains. Huddleson believes that brucella infection in goats and man occurred in Spain and neighbouring countries in the early 15th century and was taken to America by the Spanish invaders, but the first recorded epidemics of contagious abortion in the U.S.A. were in 1864, the first case of undulant fever to be recorded there was in 1905 and it was even later that *Br. melitensis* infection of goats and man was found in Texas and other Southern States. Was brucella imported and if so, which strains and when? Certainly there were opportunities for such importation, as is shown by the story of the S.S. *Joshua Nicholson* which may not be familiar to all of you. This cargo steamer left Malta for Antwerp on August 20th, 1905, having the previous day taken on board a herd of 65 goats, 61 of which were milch goats, which had been specially selected from Maltese herds for transport to the United States. During the voyage to Antwerp the goats were milking well and most of the ship's company drank their milk, the officers drinking "mixed" milk collected in a large vessel, but each member of the crew milking one goat into his own pannikin. Of 12 officers and men whose history could subsequently be verified eight had fallen ill at dates varying from the 18th to the 34th day after the date of embarkation of the goats and agglutination tests on five of these eight patients showed that the infecting organism was *Br. melitensis*. Of the four members of the ship's company who did not show any signs of illness two had drunk very little of the milk as it disagreed with them, and the other two had always boiled it. After five days in quarantine at Antwerp the goats were re-shipped on the S.S. *St. Andrew* bound for New York, and on arrival there the animals were transferred to the quarantine station at Athenia, N.J., where eventually all the goats and their kids had to be destroyed as possible sources of infection.

It is obvious, then, that we may at any time find that we have a much more virulent variety of brucella in this country than the comparatively benign abortus to which we are accustomed, such a change being due either to mutation of our prevailing strain or to the introduction of a more virulent strain from abroad. The real importance of such an event would be the possible infection of other animals than bovines, *e.g.*, sheep, pigs and goats, and the consequent increased risk of human infection from direct contact as well as from milk—and with a more clinically dangerous organism.

It is perhaps worth noting that in the United States where some years ago the different varieties of brucella appeared to be confined to their appropriate animals—*viz.*, melitensis to goats, abortus to cattle and suis to swine—every variety of cross-infection is now known, and the same kind of thing occurs to a lesser degree in many European countries.

So far we have been highly favoured in this country but, as in other fields, the price of safety is constant vigilance.

DISCUSSION

The discussion was opened by Dr. R. F. Montgomerie, Director of Veterinary Research, the Wellcome Foundation, in the following terms:—

When the Secretary of the Sussex Division of the British Veterinary Association asked that I open the discussion at this meeting, I readily assented, not because I have a wide experience of the subject, but rather because it would afford me the opportunity to pay tribute to the work of Sir Weldon in this field. Only later did I realise that this was a poor reason for acceptance, and I wish now that you had before you someone more able to do full justice to the characteristically complete review of the subject which Sir Weldon has presented. He has specialised in this field for many years and his contribution is so authoritative that the preparation of an adequate opening has indeed been difficult. I can do little more than pick out a few points on which this company may wish to have some further enlightenment from him.

It is a remarkable fact that *Br. abortus*, with the one exception which Sir Weldon mentioned, is the only variety of brucella which has been identified as affecting animals in this country. We in Britain are very fortunate that we have brucellosis in cattle as our only animal problem. In countries where the melitensis and suis varieties exist and affect particularly goats and swine, the problem of preventing the extension of infection among animals and from animals to man must be difficult to deal with. It would be greatly to our advantage if Sir Weldon could find time in his reply to give us a sketch of the position as it exists in these lands and the steps which are taken there to prevent the transference of infection from animal to man.

We have been asked to accept that the three main varieties of brucella sprang from a single stock, and I know of no evidence to controvert this. Certainly they are hard to distinguish and mutation among bacteria is to be expected. Even so, may I ask why Britain has remained fortunate in having only the abortus variety amongst its flora, and contagious abortion its only animal brucellosis? The isolation of rough strains of brucella from cattle is not, I understand, uncommon in this country, but when Sir Weldon spoke of forms intermediate between melitensis and abortus, or between abortus and suis, being constantly isolated in both hemispheres, he did not make it clear whether this also occurs in Britain. I had understood that the only recorded occasion on which a melitensis-like strain had been definitely identified here was that previously referred to. This, by itself, may be a good indication of the possibility of mutation of British strains of *Br. abortus* to a more virulent variety, but I am not entirely convinced. I had always accepted that the U.S.A. had been invaded by the three types, rather than that mutation of an existing strain or strains in that country had produced the present very unenviable position in that vast land. It is true that their brucellosis position is now a very confused picture through a variety of cross-infection having been demonstrated. Is this really something new? Might it not be that the intense interest in the subject which has been so evident over the past 20 years or so has merely unearthed a position which always existed? Would that, rather than the theory of mutation, be a better explanation?

I have no wish to discount the risks which we run so long as any animal species in this country is affected with brucellosis, but I find it difficult to accept that the strains of *Br. abortus* which have existed here for so many years have any tendency to mutate to the much more dangerous melitensis and suis varieties, to invade our goats and swine and so increase the risk to the human population. The opportunity for this to happen has existed for many years, if only in the old-fashioned idea that a preventative for abortion in cattle was the running of a goat with the herd, and in the not uncommon practice in the old days of turning an aborted cow out into the orchard which was the home of the swine. Sir Weldon's dictum, "the price of safety is constant vigilance," is one which we must respect, but I hope the apparently long odds chance that our brucellosis might extend to a more dangerous condition is not really one on which the bookmaker is likely to be caught out. I may have been quite wrong in my past conception, namely, that it is our very strict animal importation regulations which provide the vigilance that gives relative safety.

For very many years contagious abortion in cattle was, for practical purposes, uncontrolled in Britain. The order which existed, even if it could have been widely applied, could not prevent the introduction of infected animals into clean herds, because it related only to animals which had actually aborted, and there is good evidence that a large proportion of the infected do not abort despite the invasion of the foetal membranes. It has long been recognised that actual abortion in cattle was only likely to occur towards the end of the first pregnancy after infection, or during that in which infection had taken place. The risk that infection would continue through subsequent pregnancies, characterised by an almost normal calving, only became evident at a later date. Still later was the excretion of brucella in the milk accepted as a common happening in the infected cow. The recognition of the position in the 1920s led many veterinary surgeons to advise their clients to adopt a policy of eradication based on reaction to the agglutination test for brucella. Encouraged by reports from the U.S.A., many of us thought that herd eradication was relatively easily possible by this method and that by encouraging the extension of its use we might make a material contribution to the welfare of the animal industry and towards the protection of the public.

Much effort was put into the segregation of the infected from the supposedly clean, in the hope that complete eradication would be achieved. In the majority of instances failure had to be admitted. This could often be ascribed to the fact that in some animals positive agglutination does not occur until after abortion or calving. There were other reasons for these failures. I need not enumerate them now, but even where one did succeed in freeing the herd from infection, it frequently sat on an island surrounded by infected herds from which infection could easily be introduced. Sir Weldon has indicated that workers for the Brucella Committee of the Agricultural Research Council, probably with facilities not generally available, have had similar experiences. I think it is very proper to conclude that the eradication of contagious abortion of cattle by the creation of clean herds on the basis of the agglutination test can play only a very small part in improving the position, either from an agricultural or a public health standpoint.

This position had been reached in the late 1930s when investigation by the Bureau of Animal Industry of the U.S.A. determined the peculiar suitability of a strain of *Br. abortus*, which it named Number 19, as a living vaccine. It had previously been demonstrated in many investigations that vaccine prepared with killed organisms did not stimulate a useful immunity against *Br. abortus* in cattle. On the other hand, it had been shown that infection protected against reinfection. This No. 19 strain is of very low virulence —I imagine Sir Weldon would protest against its being regarded as aviruient—and it is very fixed in its characters. Provided the culture is properly controlled, a living vaccine which will not infect the cow but will produce a good protection against reinfection by field strains, can be prepared. This is not the occasion to present details of the method of vaccination, but, properly applied, *Br. abortus* Strain 19 vaccine can protect the herd from the disease, and man from infection by that milk supply. I was pleased to see Sir Weldon accept that the use of Strain 19 vaccine had been of such great help in reducing the incidence of contagious abortion in Britain. I assume that he is satisfied that it is a safe procedure as judged from the angle of human preventive medicine. I wonder how far our Ministry of Health are backing, or are prepared to back, our veterinary profession in seeking an extension of this method of control. I believe there has been some slowing down of the progress, in that fewer animals are being vaccinated to-day. I accept that it would take some years, even under an ideal system, before one could foresee the probability that vaccination of cattle would give almost complete protection against human brucellosis, or undulant fever. I am not against the proper pasteurisation of milk, but I suggest that pasteurisation must never be an excuse for not doing everything possible to eliminate milk infections at their source.

I am not competent to deal with the epidemiology of undulant fever in man, and I imagine that our medical friends will have points which they wish to raise on this subject. We on the veterinary side appreciate the difficulty of having reliable figures as to incidence, without compulsory notification. The practitioners amongst us will probably be a little cheered to know that public health laboratories generally extend their examination beyond that which is requested! Sir Weldon has produced evidence that the incidence of human cases is more than 400 to 500 per annum, and has provided good evidence that these cases arise through the drinking of raw milk. Such evidence is an additional stimulus to the veterinary profession to press forward in its efforts materially to curtail the incidence of infection in cattle. I have already expressed my view that we can help most in this direction by encouraging the further use of *Br. abortus* Strain 19 vaccine, but I appreciate that this is very much a long-term policy. I do not know if Sir Weldon has any information which would indicate whether the increased use of vaccination of the last few years is influencing the incidence of undulant fever in man. The following up of cases as they occur is very much a matter for the Medical Officer of Health, but there can be little doubt that if he has the confidence and co-operation of the veterinary surgeon his work will be much eased. The regulations as they stand to-day give the M.O.H. very adequate powers to effect protection of the public once the source of infection is detected. Some of my veterinary colleagues will wish to recount their experience of contact infection, but it is evident that greater importance by far must be placed on infections from the drinking of raw milk or the consuming of milk products which have not been sterilised.

In conclusion, I must ask you to accept my apology that this opening of the discussion has not contributed more. The quality of Sir Weldon's address was such that it left little opportunity for general remarks, although it conveyed so much information. I am sure it must have stimulated many in the audience to much greater interest in this subject and I only hope that I have left ample time available to those who wish to hear Sir Weldon on particular points.

General Discussion

Dr. Hingston asked Sir Weldon if he could say precisely what degree of curing of cheese was necessary before one could be sure that any brucellae in the milk had been killed.

Dr. Jamieson: On five occasions in the last two years *Br. melitensis* had been isolated in their laboratory from the public milk supply. These findings had been confirmed by workers at Weybridge and at the London School of Hygiene.

Dr. LANGFORD : The difficulties of the public health man were even greater than Sir Weldon had indicated. Brucellosis was not specifically mentioned in the Milk and Dairies Regulations (1949) although it would presumably be included in the category of disease of the udder and teats. Although an order could be issued to prevent the supply of milk, such an order must be withdrawn as soon as the infectious condition was ended. In practice it was virtually impossible to prove that human disease had been caused by any given milk supply since there were very few people indeed who drank milk from one supply only. Nearly everyone ate out occasionally, for instance. In cattle *Br. abortus* infection was said to lead to retention of the foetal membranes. Had it ever been found in retained placenta in the human ? Urethral discharges were often also seen in man and Dr. Langford wondered if any of these were associated with brucella infection.

Dr. BERESFORD asked if, in view of the prevalence of abortion in pigs, *Br. suis* had ever been found in this country.

Mr. SCARNELL thanked Sir Weldon for his efforts to publicise the dangers of brucella infection. He compared and contrasted the host-parasite relationship in man and animals. Mr. Scarnell was under the impression that *Br. abortus* was excreted in the milk of an infected cow only immediately after calving or an abortion. If, indeed, the organism recently isolated in this area from cattle was *Br. melitensis*, would Sir Weldon not have expected human infection ? Mr. Scarnell asked if any information had accrued from the appeal Sir Thomas Dalling made in 1950 for specimens from cases suggesting *Br. suis* infection.

Mr. WILLETT asked if there was any evidence of brucella being transmitted from man to man.

Mr. PASFIELD expressed the opinion that there was often room for improvement in the attitude adopted by the Public Health Officers towards the veterinary surgeon in practice. Orders for the heat-treatment of milk were frequently served on herds in which there had been no abortion or other clinical evidence of brucella infection for at least 10 years.

Mr. TYRELL : He frequently received notice that *Br. abortus* had been isolated from milk, but in no case so far could such reports be correlated with a history of abortion in the herd. In every case, however, Strain 19 vaccine had been used. Despite the reported finding of *Br. melitensis* in milk on five occasions, no cases of human Malta fever had been reported. What, then, was the significance, if any, of brucella organisms in milk ?

Dr. JAMIESON pointed out that herds of cattle excreted brucella long after they had ceased to abort, or after they had been vaccinated with Strain 19. His laboratory had isolated brucella from approximately 10 per cent. of all the herds from which raw milk samples were received. Questionnaires were sent to the owners of these herds and from the replies it would appear that no cows had ever aborted in any of them ! The absence of abortion was no guarantee of the absence of brucella.

Mr. PASFIELD : He was still not convinced, since reports were received of brucella being recovered from pedigree herds in which all the young stock were blood-tested before vaccination. Even where no positive agglutination test results had been received over many years, the presence of brucella in the milk was still reported. Furthermore, even where the most vigorous attempts had been made to find brucella in the cattle without success, these reports had still been received and he would like to know quite how the public health officer arrived at his decision that the milk was infected.

Dr. JAMIESON : In their laboratory brucella was detected by cultural examination and by guinea-pig inoculation. One should not talk of negative agglutination test results without indicating the suspension and technique used ; he would respectfully suggest that the vigorous attempts made by Mr. Pasfield to recover brucella had not been vigorous enough.

Mr. CALDWELL remarked that he had noted that the same herds were constantly referred to in reports of brucella infection in milk which he had received and he therefore felt that these reports should be treated with respect. In any case it was his opinion that even where there was doubt the milk should be pasteurised.

Mr. MCCULLOCH asked Dr. Jamieson if he used Strain 99 or Strain 19 as the suspension for his agglutination tests.

Dr. JAMIESON replied that he used Strain 99.

Mr. KERSHAW : In Spain great interest was shown in arthritic conditions in man associated with brucella infection. He himself had had brucellosis and was now suffering from an obscure arthritis.

A MEMBER OF THE B.M.A. told of *Br. melitensis* being recovered from a cow in Sussex. The farmer's wife who occasionally milked the cow became ill, and her blood serum contained *Br. melitensis* agglutinins. Following antibiotic therapy she had recovered. The cowman who habitually milked the cow was not, however, affected.

Dr. BOWEN asked Sir Weldon's opinion of the use of brucellin and also enquired if there was any advantage, from the safety point of view, in drinking goats' milk.

Mr. CHIPPERFIELD told of inadvertently injecting himself with Strain 19 vaccine. The resultant lesion had resolved following the use of chloromycetin, but he wondered if there was any likelihood of undulant fever developing.

The Reply

Sir WELDON indicated that time would not allow of his replying to all the points raised. He did not think that Mr. Chipperfield would contract undulant fever as the result of the Strain 19 inoculation.

Replying to Dr. Montgomerie, he said that he could give only a short review of the position in other countries. In such countries as Turkey, Israel, Yugoslavia, Tunisia and South America, goats and sheep were most commonly infected. In the swine-raising areas of France, Germany, Denmark and the U.S.A., *Br. suis* was most important. We must realise that in many areas of these countries people lived in very intimate contact with their animals and consequently the difficulties of preventing infection from animals to man were very great.

In goats the disease was occult and none of the vaccines used in cattle had proved to be of the slightest use in swine, sheep or goats. There was a high incidence of brucella infection in workers in the pork-packing plants in the U.S.A. In that country it had been found that the best way to eliminate infection in pigs was to remove the young at birth and rear a separate brucella-free herd.

It was true that aberrant melitensis-like strains existed in this country. These strains did not, however, cause disease as did the true melitensis. If they did, it was probable that our goats and sheep would now be infected. It should be stressed that our methods of differentiating between the species of brucella were still very imperfect. Some authorities suggested that only biochemical tests should be used in future and that the serological tests should be discontinued ; whilst this would certainly simplify the problem of identification, there were many objections to such a course.

There was no direct evidence that brucella had ever undergone mutation, but the various species resembled one another so closely that they were forced to conclude that they all sprang from a single stock. It was certainly important to keep the other brucella species out of this country, and Sir Weldon agreed with Dr. Montgomerie that it was the Ministry of Agriculture regulations which had been mainly responsible, so far, for their non-entry. Nevertheless, we could not feel completely safe. *Br. tularense* had recently spread over the continent of Europe from the North. It had now reached the Atlantic coast of France and there was no reason, if adequate precautions were not taken, why it should not reach this country. If once it did so, its eradication would be very difficult.

Strain 19 vaccine had been shown to be perfectly safe from the public health point of view. No case was known of a person contracting undulant fever from the milk of vaccinated cattle, but the disease had occurred occasionally after accidental injection of the vaccine.

In reply to Dr. Hingston, Sir Weldon said that any fresh cheese made from unpasteurised milk might be infected. Whilst appreciating the difficulties described by Dr. Langford, Sir Weldon considered that the new regulations had given the M.O.H. a new weapon to use in the fight against brucellosis. It was generally accepted that brucellosis came within the scope of the Milk and Dairies Regulations (1949). We must do all we could to persuade the dairyman to pasteurise his milk and it was useful to be able to point out that he could have an action brought against him in common law.

Brucella had been grown from human vaginal discharge and from the placenta ; in some countries it was occasionally found in urethral discharge, and in Mexico and the Argentine occasional cases of orchitis had been described.

It was felt that in this country the organism was not recovered from man as frequently as it should be. In the U.S.A. it was grown much more frequently—presumably because of the improved techniques used. Culture and sub-culture must be continued for 35 days before being regarded as negative.

Br. suis had never been isolated in this country, although frequently looked for.

Sir Weldon was sorry that there appeared to be some misunderstanding between the medical and veterinary profession about the serving of standstill orders and he was glad that the grievance had been ventilated at this meeting. Such meetings could do much to foster good will between the two professions.

Arthritic conditions caused by brucella were comparatively uncommon in this country. In countries where *Br. melitensis* and *Br. suis* occurred, however, they were frequently seen.

Brucellin was only of value to give a negative retrospective diagnosis. A positive reaction to brucellin was certainly not evidence that the patient had undulant fever. Man to man transmission would appear to be rare, since in only four instances out of over 1,100 cases was there more than one person in the family with undulant fever.

THE ORGANISATION OF RESEARCH

Discussion by the Association of Veterinary Teachers and Research Workers (Northern Region) *

Professor R. E. Glover (Liverpool) opened the discussion with an address, an abridged version of which is as follows :—

In opening a discussion on the organisation of research it might be helpful to deal with this topic, in the main, from the point of view of the young research worker. The recently qualified graduate who is attracted to the research field and who may feel that he can make valuable contributions in this sphere is often perplexed as to the best method of attaining his ambition and is frequently unaware of the openings which are available to comparatively inexperienced workers.

If we look back on the progress of veterinary research we find that there are a number of stages which have led to the development of the somewhat complex organisation which now operates in this country. During the latter part of the 19th and the commencement of the present century veterinary research was kept alive in the main in the veterinary schools. Funds were very limited and were obtained largely from private sources. In many instances a diagnostic service on a fee-paying basis was necessary to obtain the necessary support for research. Prior to 1914 small sums were made available by the Development Commissioners, but in general, successive governments failed lamentably to appreciate the importance of research as the basis for the control of animal diseases and the paramount importance of attracting potential research workers by providing positions with reasonable salaries and prospects of promotion. Young veterinarians who were not minded to enter general practice found that it was difficult if not impossible to secure a post in Great Britain and had it not been for the Colonies, India, etc., they would have found little scope for their talents. In fact, however, some of our research workers, who subsequently attained world eminence, were attracted to the Colonies, where they played an important part in the creation of new veterinary teaching and research centres staffed in the main with men from this country. This migration to the Dominions during the early part of the century has undoubtedly been of mutual benefit to overseas countries and ourselves.

As a result of the 1914–18 war, which brought into sharp relief the dangers to which this country can be exposed when partly cut off from its overseas food supplies, it was realised that we could not afford to neglect the heavy losses from diseases sustained by our farm animals. From this time there has been an ever increasing recognition by successive governments of the need to support veterinary research and increasing sums have been made available year by year. At the present moment the funds for research are disbursed through four main channels :—

(*a*) The University Grants Committee which, by block grants, finances research institutes controlled mainly by universities.

(*b*) The Ministry of Agriculture, which is responsible for the Central Laboratories at Weybridge and regional laboratories under its control.

(*c*) The Agricultural Research Council, and

(*d*) Independent organisations including various commercial firms.

A career in a British university usually carries some teaching responsibilities ; nevertheless, the universities have developed as robust centres of fundamental research and are eager to promote an atmosphere in which a research student can pursue scientific investigations without undue regard for the immediate practical application of the results. In th veterinary field the Ministry of Agriculture supports its own fine laboratories at Weybridge and encourages field research in the regional laboratories at the various veterinary investigation centres. The Agricultural Research Council now advises the Government on the disposal of comparatively large sums for agricultural and veterinary research. Although investigations undertaken in institutes under its direct control are, in relation to the total sum expended, fairly small, the Council is most active in supporting researches in many institutes throughout the country by means of grants which may also cover the salaries of temporary workers. The activities of the A.R.C. and of certain commercial firms are a fairly recent development : many of the latter who are now engaged in the preparation of veterinary biological and other products, which require careful tests before issue, employ veterinary staffs who are making valuable contributions in the research field.

The new graduate who is attracted to research may find himself unable to accept a research post because of the relatively low remuneration in some branches : moreover, he cannot expect immediately to undertake a problem of a research nature without considerable guidance. It is not always clearly recognised that the undergraduate instruction is, or should be, based on broad principles and should not include a detailed knowledge of laboratory techniques. This knowledge must be acquired after graduation. There are certain advantages in courses of lectures and post-graduate practical classes such as the instruction in bacteriology and immunity given at the London School of Hygiene and at the Department of Bacteriology in Manchester. Not only are the diplomas which are awarded of high standing, but the courses provide a solid basis for a future research career. Many potential research workers may feel, however, that they can ill afford another year of study after the five years leading to the registrable degree. The alternative is to seek a post in one of the laboratories which undertake a diagnostic service for practitioners.

A striking and very satisfactory development of recent years has been the substantial increase in the number of scholarships awarded for suitable training. Grants are now administered by the Ministry of Agriculture, the A.R.C., the Colonial Office, the Animal Health Trust ; in addition, some are available from bequests made to the R.C.V.S. If a young worker is unable to obtain a grant, he may well be able to set his foot on the bottom rung of the ladder by starting as an assistant lecturer in one of the veterinary schools or by joining the staff of the Ministry of Agriculture. Men who have shown an ability for research and have had a sound training on broad lines are unlikely to find any difficulty at the present moment in securing a suitable post as there is an insufficient number of young workers to meet the needs of research. The time may come, however, when competition for these posts will be keen and only those who have shown a marked aptitude will be accepted.

The young research worker is not always able to choose the environment in which he will work. If, however, during his formative years he has a choice he should give some thought to the type of institute in which he is going to work and the type of investigation he may wish to follow. He may be faced with a choice either of a small institute in which only a few problems are being investigated or a large institute as, for example, the National Institute for Medical Research or the laboratories at Weybridge, where every type of biological research is being undertaken. The advantages of a large institute with many sub-departments are self evident. For example, if the young research worker selects a bacteriological problem for investigation he should be able to obtain the

* Meeting on July 7th, 1952.

advice of specialists in chemistry, biochemistry, immunology, etc., and the quality of his work may thus be improved. On the other hand, there is a tendency to the formation of teams of workers each of whom is responsible for a small part of an investigation and the young worker may be unwillingly or unwittingly forced into a narrow groove. Under the guidance of a senior worker he may appear to make much faster progress than those others who have first to learn a multiplicity of techniques, but I think that in the long run he may find that his research experience is built on too narrow a foundation. There is a danger, which is by no means unreal, that he may become dependent on the mechanical devices which are placed at his disposal. Large research institutes are frequently provided with well-equipped workshops which will produce elaborate apparatus. No one will belittle the value of specialised equipment in the hands of the experienced research worker, but for the beginner excessive attention to the use of complex apparatus may lead to an atrophy of original ideas. Many of the most outstanding discoveries have been and are still made with the most primitive of apparatus. It is an excellent discipline for the young research worker to develop his own techniques to meet his own particular needs.

In a smaller institute the scope may be more restricted but there will probably be greater opportunities for individual efforts.

Many young workers are naturally anxious to obtain higher degrees. This is a commendable ambition and will aid the student in developing his powers of observation and will also teach him how to set out his results in an orderly fashion. For the student who already possesses a university qualification, the degrees of M.Sc., M.V.Sc. and Ph.D. are usually available. The choice of a subject may be limited, bearing in mind that the thesis may have to be presented in a restricted period of say two or three years. I would strongly advise any student who is working for a thesis, having decided on the broad outline of his problem, to spend some time in a thorough survey of the literature. Experience shows that there is an increasing tendency to overlook the findings of previous workers and hence to advance as original ideas principles which have already been established. In the actual preparation of the thesis it must be remembered that a good literary presentation is essential and the advice of a senior worker should be sought. A thesis, however, is seldom cast in a form suitable for immediate publication. Too often the writer, realising that a journal cannot accept all the details necessary for a thesis, contents himself with the preparation of two or three papers put together by cutting up the thesis and removing sentences or paragraphs. This arrangement is usually most unsatisfactory : it is far better to start afresh and prepare papers specifically for the journal selected.

Promotion in the university grades and appointments to higher posts elsewhere are often dependent on published work. It is a debatable point as to whether the overwhelming insistence on a string of publications is necessarily the best criterion by which to assess merit. Moreover, the scientific journals are experiencing an increasing difficulty in reserving space for the ever growing spate of articles and it is not improbable that the young worker, unless he is collaborating with a more senior person, may be unable to find an outlet for his discoveries. It is hoped that some other method will be devised for selecting promising research workers.

I recognise that in the fields of physiology, biochemistry, animal husbandry and so on, the training of the research worker may follow different lines from those of bacteriology and pathology ; moreover, I have not touched the subject of clinical research, appreciating that in this field many special difficulties present themselves.

Mr. R. S. Roberts (Runcorn), who followed, said : Professor Glover has dealt ably with a difficult subject. He has laid before you the framework within which research must proceed, the laboratories, the personnel and the financing. These are the essentials which the community provides. In continuing this discussion I would like to bring into perspective the real working part of this research organisation ; in fact, the research worker himself. Modern research work is a concentration into more defined channels of some of the process of development of man's mastery over his environment. It is still a part of the process which, in its incipient form, is seen in the prehistoric development of flint implements. Humanity has now recognised the existence of this process of development and is deliberately encouraging it. Over this long vista of development it is possible to recognise a common pattern ; first, the conception of an idea, then its experimental application, and finally, the propagation of the knowledge.

It would be salutary, in my opinion, if there was a more tacit acceptance of the fact that basic ideas are rare and precious. To refer again to prehistory, where the course of development can perhaps be seen more clearly : early spears were made by inserting a prong into the end of a stick and binding the attachment. It took hundreds of years to introduce the obviously better method of placing the shaft in a socketed spearhead ; even this simple idea was conceived only in a number of stages. In our own days, we may instance the idea of the valves of internal combustion engines, which, although obviously not the best idea that could have been dropped upon, has nevertheless been used, in the absence of a better one, for over 50 years, in a century of stupendous engineering progress. It is impossible to pass on without a reference to the fact that one brilliant idea opened the field to the development of antibiotics. It is remarkable that so little attention is paid in the organisation of research, first, to the detection of persons likely to conceive ideas, secondly, to the study of conditions in which ideas arise, and thirdly, to the sympathetic consideration of ideas. Without fruitful ideas, not only does research work stagnate, but conditions develop in which ideas are less likely to arise. The main point, however, is that we are surprisingly ignorant of the means of generating ideas and this is the question of importance I wish to put to the first speaker. How does one stimulate the birth of ideas ? Is continuous work more propitious than abundance of leisure ? Is there an argument in favour of intermittent bursts of activity ? Does extensive reading lead to the birth of ideas or does it tend to set the mind into orthodox channels ? Is a strong background of knowledge in the field of research a help or hindrance, or, alternatively, should a research worker remain in a narrow field or transfer to other fields, into which he may arrive with clearer vision than those already there ? On the correct answer to these questions depends whether research energy is spent on fruitful ideas such as the development of a jet engine or on some fruitless mission such as the counting of the spines on a hedgehog.

The conduct of the research can be evaluated independently of the quality of the idea or hypothesis. Whether pursuing a good or a poor idea, the necessity for efficiency remains. The emergence of research as a profession is a relatively recent event and perhaps too little attention has been paid to the teaching of methods. Much of the research worker's activity is inevitably concerned with measurement, and in biological research he is concerned generally with the measurement of response. Training in the mathematical approach to this is essential. Over his first years as a research worker he acquires piecemeal a wide competence in laboratory technique. By stages he improves his methods of recording

and examining results and his knowledge of the defects in his materials. Much of this could be taught to him in an organised course ; such teaching would be more efficient than the present system of allowing young research workers to glean the information over a period of years as juniors in research institutes.

The researches of the individual are financed eventually by bodies which may not have the scientific background necessary for an appreciation of the value or prospects of his work. Such bodies are frequently advised by other scientists. In this lies the importance of reporting the results of research in an adequate manner, and the worker who fails to do so may find himself hindered in the prosecution of his work. There is much room for a careful consideration of the principles which should guide the research worker in the nature of the material he publishes. It is sometimes thought that the publication of research results must consist of evidence that the reporter is being truthful. The simplest method of deceit in a research paper is the omission of results which contradict the main contentions ; no amount of meticulous recording will prove that he has not done this, and therefore the assumption always must be made that the reporting is truthful. The manner in which the results were obtained is to a large extent irrelevant, and it is far better for the research worker to publish only the results of experiments which he has carried out in the spirit of a demonstration, quoting sufficient detail to enable the demonstration to be repeated by others. This, and the use of mathematical techniques to convey the exact meaning of the results in a brief form, would be a great benefit to the mass of readers of research papers and would enable the trend of the worker's researches to be appreciated better and more widely.

The third opener of the discussion was Mr. D. L. Hughes (Thurgarton), who said : I would like to discuss the subject under three headings :—

Firstly—*Recruitment* : We need to think about the motives of any young person who may express a wish to enter research. Fifteen to 20 years ago most people entering research did so for the quite straightforward reason that they felt research offered them an opportunity for investigation and the answering of problems confronting veterinary workers. I am not sure that to-day the motives are always quite so straightforward. In the old days the number of posts available and the salaries attached to them were hardly numerous or large enough to be really attractive. To-day there are many more opportunities and the salaries are adequate ; furthermore, the word research has achieved a certain "glamour" value. Certainly a number of young graduates who express a desire to undertake research do not seem to be very clear in their own minds as to what it entails, and in many cases their reasons for wishing to enter research are confused. We must be careful that those people who are accepted as suitable recruits for research are of the right quality—brilliance of intellect is by no means an essential qualification. I am quite convinced in my own mind that the first two or three years in research should be spent in acquiring experience and knowledge of a particular discipline. One cannot condemn too strongly the idea that the early years should be spent in work on a particular problem, especially when the opportunity is also taken to work for a post-graduate degree. I would go so far as to say that it might be desirable to forbid recent graduates to work for a Ph.D. degree until they had been qualified for an adequate number of years. Many Ph.D. degrees are almost valueless as a mark of ability to undertake research. There is a serious risk that these post-graduate degrees will become of little value if the present tendency continues for every young research worker to feel that his period of training must be crowned by the award of a degree based on research.

Secondly—*Planning and Organisation* : The degree of planning of research work will vary considerably from institute to institute according to the type of work on which it is engaged. Thus in commercial laboratories a considerable degree of planning is needed, for very often experiments will have to be integrated with a number of different departments—the biological testing of a compound will depend on adequate liaison with the chemists making the compound and the pharmacologists providing the necessary pharmacological background. Reluctantly I have to admit that this type of planning is best achieved by the committee system. I am not a great admirer of the committee system but it has its place and it will occasionally have to be used. In government laboratories the problems needing solution are frequently decided at a high level and the laboratory concerned has the problem given to it. A good deal of planning is required and again it may be that the committee system is called for. In the more academic type of institute the problems pursued are more frequently chosen by the persons who are to do the work and the necessary planning may need no more than a friendly chat between the head of the department and the senior workers. To me this is one of the great attractions of the academic life. Professor Glover has mentioned the difficulty which may be experienced in selecting problems to work on. His examples of Hirst's observations of the agglutination of chicken red cells by influenza virus and Bloch's description of the aggregation of the tubercle bacillus are nothing less than examples of genius. These are not things one can train people for ; the best we lesser mortals can do is to see that the right atmosphere and the right environment is provided for such genius to flourish. However, the best method of selection of problems is to go out into the field and ask the veterinary surgeon or the farmer what their problems are. One will not lack for answers. A main problem will automatically bring out further problems, very often of a technical nature, and as one becomes engaged in experiments they will frequently pose more questions than provide answers.

Finally, a few words about *Direction* : Four years ago we had a meeting at which we discussed this same subject ; several of us on that occasion were a bit acid in our comments on directors and direction. Although my point of view has necessarily changed somewhat, I still feel that many of those comments are still valid. I do think it is important that each worker in addition to his main problem, which may have been selected for him, should also have a subsidiary problem, preferably chosen by himself. It is an extremely valuable safety valve to be able to turn to a minor problem on another topic.

In conclusion, we must recognise that there are no hard-and-fast rules for handling research workers. Certain workers may give of their best when working in a team, others of an individualistic nature are best left on their own. Some workers appreciate frequent enquiries and questions on the progress of their problems, others resent too frequent enquiries and develop a sense of being hounded. Each worker must be handled in the way which suits his temperament best. It may surprise some people to be told that research workers are human beings like anybody else and must be handled with all the variety of understanding that human nature demands.

Mr. D. D. Ogilvie, speaking of the ways in which ideas for research projects were obtained, said he had found that frequently difficulties were encountered by one worker in a team which suggested themselves to other workers as problems which they could

study profitably. He found that a friendly "tea-table" atmosphere in a team was stimulating.

Professor J. G. Wright said that when considering recruitment for research it had to be remembered that after doing their National Service, veterinary surgeons did not qualify till they were 26 or 27 years old, at which age they were considering marriage and were not interested in the relatively poorly paid scholarships in which they could obtain experience in research methods. He also pointed out that the profession needed a balanced research organisation which had to include clinical as well as bacteriological and other laboratory workers, and regretted that most post-graduate degrees were not readily available to clinicians. He referred to the great differences between preventive and clinical medicine, pointing out that most members present were interested in some branch of the former. He said that the clinical workers had to spend long periods observing animals, and could not pass on this work to assistants, in the way in which laboratory workers could obtain help in doing routine analyses. In addition, in recording his work, the clinician had to give descriptions of his observations which could not be summarised or tabulated and so clinical papers tended to be longer than those based on laboratory work, which often delayed their publication.

Mr. F. T. W. Jordan asked Mr. D. L. Hughes why he advised a subsidiary research subject. The latter replied that it was to prevent boredom and keep the worker from getting into a groove.

Mr. K. C. Sellers said that Ph.D. and M.Sc. degrees were considered as training degrees, and the facts that candidates were selected before being allowed to take these degrees and that their work was supervised provided a sufficient control over the quality of the work. He wondered what research workers gained by the advice they were so often given, to go into practice for a year. He felt it would be far better for them to go to a diagnostic laboratory or a veterinary investigation centre for a similar period. In planning a research project he felt that experiments should be designed to disprove as well as prove an hypothesis.

Mr. A. Pinsent, referring to applicants for research work who were looking for an easy job, said that these could be discouraged by presenting a difficult problem for their consideration. If, after that, they still persisted they might be worth encouraging.

Mr. L. E. Hughes said that in cases where the figures and data compiled were too extensive for inclusion in published papers, the results could be given and photostat copies of the data deposited at various centres at which they could be studied by workers who were particularly interested in them.

Mr. A. G. Singleton referred to training in physiology and biochemistry. An honours course could be taken immediately after the second professional examination, or at the end of the veterinary course. In the former case a student had had less time in which to forget his chemistry and physics, but by the latter method he was more able to approach the subject with a veterinary outlook. It was not easy to undertake an honours course after a long period in practice.

The Reply

Professor R. E. Glover, replying to the points made by other speakers, said that Mr. Roberts had given them some interesting and stimulating views on the training and development of the research worker. He agreed with him that formal courses were of value to the young worker since, if properly organised, they gave a wide training in a variety of techniques; moreover, the encouragement which he received by discussions with his teachers was likely to develop his critical faculties and his desire to break fresh ground. Mr. Roberts had also rightly drawn attention to the importance of the recording of experiments in a satisfactory manner. No rules could be laid down for training in the preparation of a scientific paper. Some workers, by a careful study of the contributions of more senior workers, could appreciate the salient points and the weaknesses, and soon learned the technique of setting out their results in a clear and concise manner: others, on the other hand, required considerable guidance. Similarly, the recognition of worthwhile lines of research could not be taught. In some cases inspiration might stem from extensive reading of a subject and an ability to appreciate whether the ideas of other workers were capable of further development: in other cases a prolonged study of the literature merely led to an elaboration of experiments already completed and might do little more than confirm the results previously obtained. If a worker had the capacity to devise and execute experiments in which the approach to the subject was original, he could soon learn the methods which were best suited to his own temperament.

Whilst the help of a senior worker was generally essential during the formative period of a research worker's career, it was, in his opinion, a great mistake to over-guide his efforts: such intense supervision might well lead to an atrophy of original thought. This, in fact, was one of the dangers of team-work which must be borne in mind. On the other hand, as pointed out by Mr. Ogilvie, the interchange of ideas between members of a team might, if their minds were of the receptive type, lead the worker into new lines of research.

The young investigator need not feel too discouraged if the problem which he undertook did not necessarily yield results of the first magnitude. As Mr. Hughes rightly emphasised, the rare occasions when startling new facts appeared in the literature were usually the mark of genius, but without the gradual build-up of the facts supplied by the less gifted who had to be content with more modest achievements, even genius might fail to flourish. He had the impression that many of our young research workers failed to show evidence of what he would call the enquiring mind. Too often research was confined to a fixed and routine regime. The keenness of the young worker could best be judged by his spontaneous desire to perform in his own time simple technical exercises because he had sufficient interest in research to realise that he must master the techniques of his vocation, and to learn to overcome the difficulties as they arose.

PRESERVATION OF THE MANX CAT

There has been a decrease in the numbers of Manx cats of recent years, possibly due to the castration or spaying of some of the best specimens, and a meeting of those interested in the preservation and improvement of the breed was held in Douglas on January 28th. A society to be known as The Isle of Man Manx Cat Association was formed, with Mr. D. W. Kerruish, M.R.C.V.S., of Parkfield, Douglas, as Chairman and Mr. G. B. Stubbs, M.R.C.V.S., of "Homefield," Douglas, as one of the Committee.

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COMMONWEALTH AGRICULTURAL BUREAUX

The executive council of the Commonwealth Agricultural Bureaux has elected as Chairman Dr. E. Marsden, the New Zealand representative, in succession to Mr. J. E. Cummins, representative of Australia. Mr. W. F. C. Morton (South Africa) has been elected Vice-Chairman in succession to Dr. G. R. Bates (S. Rhodesia).

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BURNS' SUPPER AT LASSWADE

On Wednesday, January 28th, a gathering of about 60, comprising the staff of the Veterinary Laboratory of the Ministry of Agriculture and Fisheries at Lasswade and friends, attended a Burns' Supper at Eskgrove. The guests included the Chief Veterinary Officer, Mr. J. N. Ritchie, the Director, Dr. Stableforth, and Mr. J. A. Aldridge, from Weybridge, Dr. Pranoto, from Indonesia, Captain Norman Bisset, Dr. Greenwood, Director of the Poultry Research Centre, Dr. J. Russell Greig, Dr. J. T. Stamp, Messrs. J. W. Burgess and R. Hood, of the Royal (Dick) Veterinary College, and several members of the Ministry of Works, including Mr. Kirk, Senior Architect, Messrs McMyn, Wilson and Lennie, District Surveyors, Mr. Geary, District Engineer, and Mr. Richardson, Supervising Engineer. Professor Robertson was prevented from attending through indisposition. The haggis was "piped in" in traditional fashion by Mr. Burgess and addressed by Mr. J. E. Wilson, who presided. The "Immortal Memory" was proposed by Captain Bisset and Mr. Ritchie toasted "The Lasses." Dr. Russell Greig recited "Tam o' Shanter" as only he can. His rendering is unforgettable to those privileged to see and hear it. Thereafter the company was entertained to a programme of Scots songs and dancing by the laboratory choir and team of country dancers, and other artists.

CLINICAL COMMUNICATION

DIARRHOEA IN PIGS

P. L. SHANKS, B.SC., M.R.C.V.S.,

VETERINARY INVESTIGATION OFFICER, BUCKSBURN, ABERDEENSHIRE

The majority of cases of diarrhoea or scouring in pigs are probably non-specific and a symptom of a general disturbance. It occurs, for instance, in such diseases as swine fever, anthrax and the enteric form of paratyphoid. Sudden changes in food or in feeding may cause a disturbance in the digestive system and lead to diarrhoea usually of a temporary nature, while necrotic enteritis is believed to be due in some cases to a lack of vitamin B since the condition responds to treatment with yeast. The greyish scour in nutritional anaemia is well recognised and irritants in the food such as poisons produce a gastro-enteritis with diarrhoea.

There are some forms of diarrhoea or " milk scours " in young pigs in the North of Scotland which do not fit into any of these classes and an attempt is made to account for some of them.

Apart from the well-known causes of scour it is a commonly held belief amongst pig breeders that a mild diarrhoea occurs in suckling pigs at about three weeks old and again about six weeks old. It lasts a few days and causes no loss in condition. The time of occurrence suggests the possibility that a silent heat occurs in the dam with an alteration in the quality of the milk. On the other hand, it is customary to allow pigs at about that age access for the first time to creep feeding and the taking of solid food may be responsible for the mild digestive upset. Occasionally this temporary scour becomes persistent, leading to wasting and loss in condition. It is assumed in these cases that bacteria are responsible for the secondary effect although no particular group of bacteria has been implicated.

Another form of scour not infrequently noticed is a milk-coloured scour occurring at any age during the suckling period and associated with a change in the feeding of the sow. It may be that, in some cases, the change is only from one bag of the same type of meal to another while in others it may be from a bag of meal supplied by one dealer to a bag supplied by another merchant. Again it appears that it is a change in the quality of the sow's milk after the change in food that is responsible for the diarrhoea in the young pigs. As in the previous form, a superimposed bacterial infection occurs occasionally, leading to a persistent diarrhoea with loss in condition.

There is still another form of scouring which appears to be even more prevalent than any of the others. While the others occur spasmodically in litters, this last condition spreads rapidly through a rearing house, attacking the majority of the litters as if due to an infection. It may occur in pigs at any time throughout the suckling period from a few days old to weaning age. All degrees of severity may be seen. Some die in a few days and in others it becomes chronic. A certain loss in condition occurs in all cases, so that at weaning time the litter is very uneven, showing one or two pigs of average weight, one or two very poor and emaciated and the remainder below average. This unevenness continues throughout the fattening period, resulting in the majority of the pigs taking several weeks longer than normal to reach the bacon factory.

The disease occurs under all conditions of management but is worst where hygiene is poor. Pigs reared out of doors in arks have shown the symptoms, but have recovered after a few days during which they have lost condition. The time of year does not seem to influence the disease.

On enquiring into the history, it has never been possible to account for the introduction of the disease, assuming that it is an infection, and in some outbreaks, particularly on farms where the hygiene is good, the disease has disappeared after a few months as mysteriously as it came.

On *post-mortem* examination of those which die suddenly there is little or nothing abnormal to be seen except that the large intestine is distended with a creamy coloured pasty scouring material. Chronic cases, which eventually die, often show a terminal pneumonia complicated with pleurisy, peritonitis and pericarditis. Some may show a varying amount of necrotic enteritis affecting either the last part of the small intestine or the large intestine, or both.

Cultural examinations of bowel contents have frequently produced pure cultures of coliform organisms, especially in young pigs under four to five weeks old, and it is suspected that a coliform white scour analogous to white scour in calves exists in pigs. Some practitioners treat these cases, particularly when they occur in very young pigs, with *B. coli* serum and claim reasonable results.

It is not uncommon to isolate non-lactose fermenting organisms from pigs over four to five weeks old. It is difficult to identify them but they form indole and so are not Salmonella; many are suspected to be Morgan's bacillus. Other organisms isolated have been of the Proteus group and enterococci and on two occasions *S. suipestifer* were isolated; in both cases the organisms were found causing a septicaemia as well as diarrhoea. It is probable that in view of the different organisms isolated none of them is the primary cause.

Many forms of treatment have been suggested from time to time and it often happens that any one treatment has some temporary value. On many farms where indoor rearing is practised the owner has presumed that it is due to anaemia and has given additional doses of iron which by acting as an astringent have been beneficial for a short period. Repeated dosing with iron as the symptoms recur has done more harm than good. It is not associated with anaemia as pigs develop the disease while having access to grass and earth. Indeed it has been advantageous in some outbreaks to turn the affected litters out to grass although in one outbreak the reverse procedure had to be adopted and was successful for several months. The " sulpha " drugs have been used extensively particularly sulphamezathine on the assumption that the disease was paratyphoid. Again some temporary relief has been obtained. The same also applies to lime water, 1 per cent. copper sulphate solution, chalk, and a variety of other drugs. On the assumption that the sow's milk was at fault a number of cases were treated through the sow by giving her sulphur in the food morning and night for two to three days. In some of these cases the response was spectacular but was not consistent. " Aurofac " has proved to be the most successful treatment used although some outbreaks showed little benefit from it. At first the young pigs were given a saltspoonful daily until the scouring stopped, usually within 48 hours, but after a few cases had relapsed it was decided to continue dosing for a further two to three days. Relapses did not then occur. It was found later that giving the sow

a teaspoonful of " Aurofac " twice daily for three to five days had the same beneficial effect in clearing up the diarrhoea in the young pigs.

The oral administration of any of the other antibiotics has not been attempted. Perhaps this article may encourage others to give their experiences and line of treatment.

A similar disease has been reported in American literature under the title of Transmissible gastro-enteritis of young pigs. References to diarrhoea in pigs may be found in the following.

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QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work, but must be of a general nature—questions cannot be considered in which information is sought regarding diagnosis or treatment of specific cases, nor for which solely a private reply is desired. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Blind Cattle

Q. 423.—*Although I am asking the V.I. centre for their help in the matter, I would also like the advice of any other practitioner who can give his experience on this subject. A client has a pedigree Jersey herd, managed by a capable bailiff, in which during the last few years seven cows have been blind. Two were born blind, one went blind at three months, two at 18 months, one at two years and one after calving its first calf. I cannot find any reason for this ; no fault is to be found with the herd management. All the cattle are up to show standard and with good milk records. Root and kale are fed during the winter and the cattle are out all the year round except for very stormy weather in winter.*

A.—The questioner gives no information regarding symptoms or the degree of blindness, but the fact that the disease may be manifest at birth indicates that it may be an inherent defect. The possibility of vitamin A deficiency should also be considered, especially as some cases develop at the age when blindness due to this cause usually occurs, but the feeding would suggest that this deficiency can be excluded. Tests for papilloedema would, however, give information on this point.

Congenital bilateral cataract is not uncommon in Friesians and total blindness may or may not occur.[1] It has been described by Detlefson & Yapp,[2] and its occurrence in Jerseys has been reported by Gregory *et al.*[3] Gilmore states that it is inherited as a single autosomal recessive character. Strabismus has also been reported in Jersey cattle (Gilmore,[4] Regan *et al.*[5]), and is inherited as a single autosomal recessive character. The defect cannot be detected at birth, but becomes apparent after six months to a year. The eyes are crossed and protrude abnormally. The condition gets progressively worse with age, vision being greatly impaired in some adults. There are no references to congenital retinal defects in cattle but the respondent has observed a degenerative condition of the retina in Jersey cattle which may be congenital or which may develop after birth. The symptoms include partial or complete blindness, protrusion of the globe, lacrymation, dilatation of the pupil, and transient nystagmus. In the field there are no really practical steps one can take to avoid the condition especially where individuals only are affected.

REFERENCES

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[3] GREGORY, P. W., MEADS, S. W., & REGAN, W. M. (1943). *J. Hered.* **34.** 125-128.

[4] GILMORE, L. O. *J. Dairy Sci.* **33.** 147-165.

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" Injection for Sterilising Female Cats "

Q. 424.—*I have been questioned several times lately by members of the public as to the existence of an " injection for sterilising female cats." As I am unaware of any way of neutering other than by actual operation I should be interested to know what this method is. I ask because there seems to be an increasing idea in the public mind that ovaro-hysterectomy is becoming a back number!*

A.—The respondent does not know of any injection which could substitute surgical sterilisation in the female cat. A medical endocrinologist consulted by him gives the same opinion, but draws attention to the fact that certain sex hormones given in sufficient dosage would have a marked effect for varying periods. The belief that " an injection " can permanently sterilise a female cat may result from cat owners' experience of a spaying technique in which little or no hair is removed, the incision minimal in size and no suture used.

ABSTRACT

Rickets in Sheep*

I.—In his introduction the author emphasises once again the importance of the three factors involved in the production of rickets both in humans and animals, namely, calcium, phosphorus and vitamin D. From the literature quoted it is clear that wide variations in the proportions of these in the ration occur in different parts of the world. For instance, the risk of D deficiency occurring where sunlight is depended upon is critical in regions and at certain times of the year when the incidence of the sun's rays with the earth becomes less than 35°. This may happen during the winter months in South Island, New Zealand, and over much of Great Britain.

For the experimental work reported groups of four sheep were employed. Initially they were put on to a basal rachitogenic diet consisting of dry sugar-beet pulp 600 g., oat-straw chaff 80 g., blood meal 80 g., urea 5 g., molasses 150 g., calcium carbonate 14 g., salt 6 g. This was low in P, high in Ca, minimal in respect of vitamin D, but was adequate in vitamin A and other food factors necessary for normal growth. Subsequently the induced rickets were cured by supplying supplements of vitamin D_2 or Ca and P in varying ratios as required.

* **Rickets in Sheep** : I.—**The Experimental Production of Rickets in Young Sheep** ; II.—**Measurements of Phosphorus Absorption.** EWER, T. K. (1951). *Brit. J. Nutrit.* **5.** 287-300 ; 300-306.

The experimental groups were fed as follows:—

(1) Basal diet only.
(2) High P basal diet.
(3) Basal diet with vitamin D_2.
(4) As (3) with D_2 given seven months after start of experiment.
(5) As group 2. Two sheep receiving vitamin D_2 seven months after start of experiment.

During the preliminary period the effect of the basal diet on the weight, haemoglobin values, serum-Ca and blood inorganic-P were checked, as likewise the food consumption. Differences in the rate of food consumption were reflected in the rate of weight gain. Within a week of the start of the experiment in high P lambs in groups 2 to 5 were consuming more than those in the other groups. The addition of vitamin D in the form of two massive doses of calciferol (see group 3) did not influence food consumption.

The basic diet had resulted in an arrest of calcification of the distal radial epiphysis at the end of two months' confinement. Clinically it was difficult to say exactly when lameness developed, but a general stiffness in gait occurred in several animals in groups 1 and 4 two and a half months after the commencement of the experiment, and bony enlargements were marked in many sheep at the end of five and a half months. Vitamin D given to the sheep in group 3 prevented the appearance of clinical rickets in all but one case. When two normal sheep on a high P and Ca level were transferred to a low P diet hypophosphataemia developed, but no rachitic lesions (a low P intake with a high Ca intake produced hypercalcaemia in most of the sheep in these groups).

These experiments indicated the importance of a wide Ca : P ratio in the production of rickets in sheep and showed that the D requirement was low when the phosphorus intake was adequate.

II.—Bearing in mind the reported influence of certain food factors such as crude fibre and readily available carbohydrate upon the digestibility of the major food constituents, the author carried out a balance trial designed to assess the influence if any of vitamin D_2 on P retention and on the digestibility of the dry matter. Single massive dosages of D_2 were given and the Ca:P ratio adjusted by the addition of phosphate. Experiments were carried out both on rachitic and normal sheep. The data regarding the food intake and the collection of excreta are given in full.

Evidence is presented which suggests that a massive dose of D_2 increases both the P retention and the apparent digestibility of the dry matter. The effect of a phosphate deficiency appeared to be not only to restrict appetite but to reduce the efficiency of dry matter digestion.

N. S. B.

LEGAL NOTES

Breach of Fowl Pest Order.—Fines totalling £18 were imposed at Lewes, on January 27th, on Wilfred Sidney Halse, of Audiburn Farm, Kingston, near Lewes, for breaches of an order designed to prevent the spread of the fowl pest.

He was fined £5 on each of three summonses for sending chicken from his farm, to which had been moved other poultry during the preceding 28 days, and a further £3 for failing to keep records of his purchase and disposal of poultry.

For Halse it was stated that he did not know the requirements of the order, of which the only notification to poultry-keepers was through the local Press.

Announcing the fines, the Chairman (Mr. F. Bentham Stevens) said the magistrates regarded it as a serious case because the poultry had been sent all over the country and it was just that type of thing the order was designed to prevent.

REVIEW

[The Microbiological Assay of the Vitamin B-Complex and Amino Acids. By E. C. Barton-Wright, D.Sc., F.R.I.C. Pp. x + 179. Published by Sir Isaac Pitman & Sons, Ltd., London. 1952. Price 18s.]

This book is written for the laboratory worker and will have little appeal for the practising veterinarian. The author's easy style and the beguiling simplicity of the procedures will stimulate many to attempt or extend this method of analysis.

Many micro-organisms, like mammals, are not able to synthesise all their nutritional requirements and depend on an external supply. If an exacting organism is chosen and all save one of its requirements are met, the extent of its growth or activity will depend upon the amount of the limiting material provided. This phenomenon has been fashioned into a method of analysis particularly suited to the determination of members of the vitamin B-complex and amino-acids. The author starts with a discussion of general principles and methods of calculation, and proceeds with chapters on the determination of riboflavin, nicotinamide, pantothenic acid, biotin, aneurin, folic acid, the vitamin B_6 complex (pyridoxine and allied materials), inositol and p-amino benzoic acid. These are followed by an introduction to the use of microbiological methods in amino-acid analysis, and details are given for 18 amino-acids. Two appendices give information about the culturing of the organisms and the preparation of various stock solutions. A few chosen references are given at the conclusion of each chapter.

Any method of analysis can be defined in terms of specificity, range, recovery, standard error, time requirement, cost, convenience and general reliability, and its usefulness for any purpose may be judged by comparison of these qualities with those of other methods available. The descriptions given here will enable the reader to make an estimate on most points, but it is rare to find a method completely defined and the author cannot be blamed for incomplete information about specificity and standard error though information in different parts of the book might perhaps be summarised with each method. In the field of vitamin B analysis microbiological methods have relatively few competitors but in the highly competitive field of amino-acid analysis the reader may need more convincing that microbiological assay is the method of choice for his problem.

There is a wealth of practical advice in the book which will be particularly appreciated by those newly entering this field. Small points may be of vital importance and are not overlooked ; for example, it is useful to be warned that " toluene used for preserving stock solutions and extracts must be sulphur free." The inclusion of information about the keeping qualities of reagents is a practice which ought to be much more widespread. The newcomer to microbiological work might, however, appreciate information about how to obtain the necessary organisms.

We are left with the impression that the text is sufficiently detailed to enable anyone to go into the laboratory and fulfil the laudable intention to complete an analysis.

WEEKLY WISDOM

Millions of acres of marginal land could be brought into production gradually if capital were available; at the other end of the scale tens of thousands of rich and fertile acres are being indiscriminately and irresponsibly filched away from food production every year. This makes no kind of economic sense for a country dependent as never before on its own resources for keeping the food shops and the family larders supplied.—Sir James Turner (Presidential Address to the 1953 annual general meeting of the National Farmers' Union).

R.C.V.S. MEMORIAL TO THE FALLEN IN THE SECOND WORLD WAR, 1939-45

Unveiling and Dedication

For a brief space on the afternoon of Friday last (February 6th, 1953) the Council Chamber of the Royal College of Veterinary Surgeons at 10, Red Lion Square, London, became a place hallowed by feelings of pride and sorrow, and treasured memories. For it was in the presence, not only of councillors, but of some 30 relatives and friends of those commemorated, that after the quarterly meeting of Council there was held a Service for the Unveiling and Dedication of the R.C.V.S. memorial to those who laid down their lives in or as a consequence of the war of 1939 to 1945. The memorial takes the form of a handsome panel similar to that erected after the war of 1914-18, and on it are inscribed 38 names.

The President, Professor John G. Wright, F.R.C.V.S., in a deeply moving address, paid testimony to those whose sacrifice was being commemorated; then called upon the Deputy Chaplain-General (Rev. F. W. Hilborne, Q.H.C.) to dedicate the memorial. The Rev. J. A. French, M.R.C.V.S., read the Lesson, led the Prayers, and gave the Blessing. The Royal Army Veterinary Corps provided a Guard of Honour and their participation, together with that of two trumpeters of The King's Troop, R.H.A., added much to the impressiveness of the ceremony.

The relatives and the invited representatives having been shown into the Council Chamber, there entered in procession: the Guard of Honour, R.A.V.C., the Mace Bearer, R.C.V.S., the Registrar (Mr. W. G. R. Oates), the President (Professor J. G. Wright), the Deputy Chaplain-General and the Reverend J. A. French. These having taken their places on the dais, on which stood the veiled Memorial Tablet, with a beautiful wreath on the desk before it, the service opened with the bidding by the Deputy Chaplain-General, and prayers for the fallen and for those who mourned. The Lesson, read by Mr. French, was from the Book of Revelation, the memorable passage describing the multitude whom no man can number and who had come out of great tribulation to serve God day and night in His temple.

The Address

The President then spoke as follows:—

"This ceremony, notwithstanding all its formality and solemnity, is still a very warm and human occasion. It is our pleasure to have with us at this time some of the relatives and friends of those whose memory we seek to honour to-day. Moreover, the profession of the veterinary surgeon is numerically a small one, and those of the profession whose names are on this memorial are not merely names to us, they are men whom we knew. They were associated with and representative of this College. They belonged to this College and they were our own close friends. Some among them were regular officers of the veterinary branch of the fighting services, and of them it may be said that it was their duty to serve in the war and they did not shrink from it. They carried out their duty nobly. But the great majority of those who lost their lives serving with the forces were younger members of our profession, who had spent only a short time in the practice of it before being enlisted, or in fact in some cases had joined up immediately after graduating from our colleges. They were all volunteers. The Government had decreed that veterinary surgeons could serve the best interests of our nation in those days of dire stress by practising their profession in the food-producing areas of the country; but for these young men that was not enough. They felt that they must serve more actively. It is not for us to examine their motives; I do not think they analysed them themselves. I know that they indulged in no heroics. That is not the way with young men sent out to serve their country. I believe they were impelled by the spirit of high adventure, that spirit which is one of the finest traits of our island race, and that spirit to which our history owes so much.

"There were some among them who fell while engaged in a civilian capacity. Prominent among them were the men of our colonial veterinary service. They served in the three main branches of the forces, and they fell in all the theatres of war—in Abyssinia, in North Africa, in Sicily, in Italy, in Norway, in Burma, in Malaya, in Normandy, in France, and in the Low Countries. They died whilst flying with the Royal Air Force. They lost their lives at sea, either serving with the Royal Navy or going to and fro on overseas duty. They died while prisoners of war in enemy hands.

"It would be trite for me to say that it is the best who fall, but as one looks at these names one sees among them those of older men who were shining lights in our profession, and whose services we could ill afford to lose. Among the younger men were recognised men of great promise, men who as students had shown great ability, men of whose future their teachers had high hopes. But it was not to be. It was their destiny that they should meet an untimely end in war. We shall never know the qualities of the service these young men might have rendered to their fellow men and to the age in which they would have lived. We shall never know the contribution they might have made to our professional progress. But in proud and honoured memory of these our professional brethren who gave their lives through the war of 1939-45 I unveil this memorial."

The President then read the list of names which appeared on the memorial as follows:—

Killed in Action

William Edward Beckett
Kenneth Gordon Comrie
Adrian Conway Jonas
Peter Hugh Joseph Keast
Lionel Lester
Kenneth Dougal McDougall
Lewis Trevor Morris
James Ralph Patterson
George Rutherford
John Watson Urquhart

Died of Wounds

Vidya Rattan Bhardwaj
Arthur Alfred Burdon Ellis

Missing in Action

Charan Parshad Chaudhri
John Joseph Clune
Robert Dunwoody
Archibald McDougald Fyfe
Douglas William Bulpin Taylor
Derek Hugh Greeves
Adrian Morrison Howie
Ernest Murray Lamb
Alfred William Peyton

Died Whilst Prisoner of War

Arthur George McCrea
Alastair Patrick Steele

Died on Active Service

Frank Baker Brocklehurst
James Heard
James Jones
Arthur John Kelly
Maurice Kirk
James Lang
Glyn Lloyd
Philip Lionel Soothill
William John McCubbin
Brian Maclean
Francis Noel O'Brien
Sydney O'Donel
William Orr
Alfred Amos Pryer
William Thomas Richardson

ROYAL COLLEGE OF VETERINARY SURGEONS MEMORIAL TABLET, UNVEILED FEBRUARY 6TH, 1953.

UNVEILING BY THE PRESIDENT OF THE ROYAL COLLEGE, PROFESSOR J. G. WRIGHT, F.R.C.V.S.

The Deputy Chaplain-General then dedicated the memorial "to the glory of God and to the sacred and perpetual memory of those who laid down their lives in a righteous cause," after which two trumpeters stationed outside the Council Chamber sounded the Last Post. Following a few moments of silence, the Deputy Chaplain-General read the passage from Laurence Binyon's *Poems for the Fallen* beginning "They shall grow not old," and after the sounding of the Reveille Mr. French led the company in the Lord's Prayer and pronounced the Blessing. The procession then left the Council Chamber.

The Assembly

Among those present at the ceremony were the following relatives: Brigadier J. J. Plunkett (for A. J. Kelly); Mr. and Mrs. Kirk, Mr. D. Kirk, M.R.C.V.S., and Miss Kirk (for M. Kirk); Mrs. L. Morris (widow), Mr. and Mrs. Trevor Morris and Mr. David Morris (for L. T. Morris); Mrs. H. Steele (widow) and two children, Rev. Dr. and Mrs. J. Steele (for A. P. Steele); Mr. and Mrs. W. Brocklehurst and Mr. W. H. Brocklehurst (for F. B. Brocklehurst); Mrs. M. Dunwoody (mother) and two daughters (for R. Dunwoody); Mr. and Mrs. L. Jones and Miss M. M. Jones (for J. Jones); Mr. Hugh Macdonald, M.R.C.V.S. (for G. Rutherford); Mr. Alex Urquhart (brother) (for J. W. Urquhart); Mrs. M. E. Beckett, M.R.C.V.S. (widow) (for W. E. Beckett); and Mr. and Mrs. W. J. Keast (parents) and Mr. Keast (brother) (for P. H. J. Keast),

together with the company named below, in addition to those already mentioned: Mr. L. G. Anderson, Captain J. R. Barker, Professor T. J. Bosworth, Professor T. G. Browne, Lieut.-Colonel J. Clabby (Assistant Director, A.V.&R.S.), Lieut.-Colonel J. L. Dalzell, Mr. H. W. Dawes, Professor J. W. Emslie, Mr. C. W. Francis (Assistant Secretary, R.C.V.S.), Major A. V. Franklin, Professor R. E. Glover, Mr. G. N. Gould, Mr. A. M. Graham (President, B.V.A.), Brigadier A. G. Heveningham (Director, A.V.&R.S.), Brigadier G. A. Kelly (Colonel Commandant, R.A.V.C.), Captain T. M. Mitchell, Dr. W. M. Mitchell, Dr. R. F. Montgomerie, Professor C. W. Ottaway, Mr. J. D. Peele, Professor L. P. Pugh, Colonel A. G. Ralston (O.C., V.&R. Training Centre and Depot), Miss M. Raymer (Librarian, R.C.V.S.), Mr. R. V. Thatcher, Captain J. F. D. Tutt and Professor W. L. Weipers.

The courtesy of the Royal College enables us to reproduce photographs, not only of the ceremony, but of the Memorial Tablet, which is similar in design and execution to the memorial to the fallen in the First World War and which eventually will be placed opposite to it in the College entrance hall.

At the conclusion of the service the visitors inspected what our readers will agree is a very fitting memorial. The perfection of the necessarily intricate arrangements for such an occasion reflected great credit on the Registrar and his staff, whose solicitous care for the more elderly of the relatives was much appreciated, as was the thoughtful gesture of the Royal College in subsequently providing the whole assembly with tea at the Bonnington Hotel.

FOOT-AND-MOUTH DISEASE

Since our last issue, outbreaks of foot-and-mouth disease have been confirmed among cattle and sheep at Fyvie and among pigs at Tarves in Aberdeenshire. In Wales, where an earlier outbreak was reported among cattle and pigs at Newport, Mon., at the week-end the existence of the disease was confirmed among cattle at Llanvair Kilgeddin, near Abergavenny. On Tuesday last foot-andmouth disease was confirmed among cattle at Stanbridge, near Leighton Buzzard, Bedfordshire.

QUESTIONS IN PARLIAMENT

Diseases of Animals Communicable to Man

Mr. Wyatt (January 29th) asked the Minister of Health the procedure for notifying the police when animals are at large carrying diseases dangerous to human life.

Mr. Iain Macleod: I understand that the hon. Member means parrots, in which case there is no procedure for notifying the police. The Minister of Agriculture has made Orders under the Diseases of Animals Act, 1950, which will enable him to deal with diseased parrots.

Cruelty to Animals (Penalties)

Mr. H. Johnson (January 29th) asked the Secretary of State for the Home Department whether, having regard to recent cases of cruelty to animals, he will consider taking steps to increase the penalties which may be imposed in the magistrates courts upon those who are convicted of cruelty to animals.

Sir D. Maxwell Fyfe: The law provides for a maximum penalty of three months' imprisonment either in addition, or as an alternative, to a fine of £25. Where the owner of an animal is convicted of cruelty to it a court has power to deprive him of ownership. I have no reason to think that these maximum penalties are not adequate.

Ministry of Agriculture Staff

Sir W. Smithers (January 29th) asked the Minister of Agriculture to state in convenient categories by how many men and women, respectively, the staff of his Department has increased during the calendar year 1952; by how many since January 1st, 1953; in what duties they are employed; and what is the annual cost to the taxpayer.

Mr. Nugent: During 1952 the staff of my right hon. Friend's Department decreased by 901. Complete information as to staff changes since January 1st is not available without special enquiry; but he sees no reason to expect an increase.

Slaughterhouses (Siting) Scotland

Captain Duncan (February 3rd) asked the Secretary of State for Scotland what progress has been made in his plans for the siting of slaughterhouses in Scotland.

The Joint Under-Secretary of State for Scotland (Commander T. D. Galbraith): Following the statement made by my right hon. Friend the Minister of Food on November 5th, the Secretary of State for Scotland is setting up a small committee to advise him, after consulting the interests concerned, on the siting of slaughterhouses in Scotland.

Captain Duncan: How is that committee getting to work; when is it likely to report, and will the report be published?

Commander Galbraith: We hope that it may be set up shortly. As I indicated in my reply, it has not yet been set up.

Veterinary Inspectors

Mr. G. Wilson (February 5th) asked the Minister of Agriculture the scale of salary of temporary veterinary officers taken on to deal with the recent outbreak of foot-and-mouth disease; what is their total number; and how long their employment will continue.

Mr. Nugent: Temporary veterinary inspectors are paid a fee of 3½ guineas for each working day. There are eight of these officers still employed who were taken on initially for duties concerned with the recent outbreak of foot-and-mouth disease, but six of them are now engaged on other duties. My right hon. Friend cannot say how long it will be necessary to retain these officers.

Mr. G. Wilson asked the Minister of Agriculture his policy with regard to the employment of local veterinary inspectors in carrying out tuberculosis tests on cattle.

Mr. Nugent: Official tuberculin tests are carried out both by whole-time veterinary officers and part-time local veterinary inspectors paid by fee. Local veterinary inspectors are normally employed only for tests of herds of their own clients, but if a whole-time officer is not available they may carry out tests of other herds.

Cattle Semen (Oaksey Report)

Mr. H. Fraser (February 5th) asked the Minister of Agriculture whether he has now received the Report of the Oaksey

Committee on the Export and Import of Cattle Semen; and what action he proposes to take.

Mr. NUGENT: The Report of the Oaksey Committee has been submitted to the Secretary of State for Scotland and to my right hon. Friend and they have considered its recommendations. My right hon. Friends would like to take this opportunity of expressing their thanks to Lord Oaksey and the members of his Committee for their valuable Report. My right hon. Friends are impressed with its recommendations and are consulting those organisations who are most closely concerned before deciding what action to take. A copy of the Report is being placed in the Library.

NOTES AND NEWS

Diary of Events

Feb. 17th.—Annual General Meeting of the Eastern Counties Division, B.V.A., at Norwich (The Bell Hotel), 11 a.m.

Feb. 18th.—Annual General Meeting of the Midland Counties Division, B.V.A., at Birmingham (The Medical Institute), 2.30 p.m.

Feb. 18th.—Annual General Meeting of the Scottish Metropolitan Division, B.V.A., in the Royal (Dick) School of Veterinary Studies, 2.30 p.m.

Feb. 18th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at 1, Wimpole Street, W.1, 5 p.m.

Feb. 19th.—Meeting of the Herts & Beds Division, B.V.A., at 70, Holywell Hill, St. Albans, 2.30 p.m.

Feb. 21st.—Meeting of the Biochemical Society, in the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, 11 a.m.

Feb. 25th.—Meeting of the South-East Midlands Division, B.V.A., at Northampton (Franklin's Gardens Hotel), 7.30 p.m.

Feb. 26th.—Meeting of the Dumfries and Galloway Division, B.V.A., at Carlisle (Crown and Mitre Hotel), 2.15 p.m.

Feb. 26th.—Annual General Meeting of the South-Eastern Division, B.V.A., at Maidstone (The Royal Star Hotel), 2.30 p.m.

Feb. 27th.—Annual General Meeting of the Royal Counties Division, B.V.A., at Reading (Caversham Bridge Hotel), 2.30 p.m.

Feb. 27th.—91st Annual General Meeting of the Lancashire Division, B.V.A., in the Veterinary Hospital, Pembroke Gardens, Liverpool, 2.30 p.m.

Feb. 27th.—161st Annual Ball of the Royal Veterinary College Students' Union Society, to be held in the Royal Festival Hall from 8 p.m. to 3 a.m.

Feb. 27th.—Annual Ball of the Veterinary Society, Faculty of Veterinary Science, The University, Liverpool, to be held in the Students' Union from 8.0 p.m. to 2.0 a.m.

March 4th.—**Meeting of the Association of Veterinary Teachers and Research Workers (Scottish Regional Group) in the Royal (Dick) School of Veterinary Studies, Edinburgh, 2.30 p.m.**

March 19th.—Annual Dinner and Dance of the East Midlands Division, B.V.A., at Nottingham (The George Hotel). Reception 7 p.m.

April 1st.—The Association of Veterinary Teachers and Research Workers: Joint meeting with the Northern Region, at the University of Liverpool Veterinary Field Station, Leahurst, Windle Hill, Neston, Wirral, Cheshire. Business, 10 a.m.; Symposium on "Skin Diseases," 11 a.m.

April 25th.—30th Annual General Meeting of the Association of State Veterinary Officers, in the Auditorium of the Wellcome Foundation, 183-193, Euston Road, N.W.1, 2 p.m.

Council and Committee Meetings of the B.V.A.

The following arrangements for the Council and Committee meetings of the B.V.A. in April and July, 1953, have been made by Council B.V.A.:—

April 20th, 21st and 22nd, in Edinburgh: *Members are requested to note change of dates from those announced earlier, viz., April 29th, 30th and May 1st.*

July 29th, 30th and 31st in London.

PERSONAL

Births.—DENHOLM.—On February 3rd, 1953, to Margo, wife of Thomas Campbell Denholm, a son—Iain Millar.

BENNETT.—On January 27th, 1953, to Sheila, wife of Peter H. G. Bennett, M.R.C.V.S., Thrumster, Okehampton, Devon, a daughter.

* * * * *

Illness of Mr. D. L. Hughes.—Our readers will regret to learn that Mr. D. L. Hughes, of Thurgarton, has had to undergo an operation for gastric ulcer. We are pleased, however, to report that he is making excellent progress in the Nottingham General Hospital, and it is confidently hoped that he will be fit to return home shortly, to enter upon a six weeks period of convalescence.

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R.C.V.S. OBITUARY

DONNELLY, James Gerald, M.R.C.V.S., Drogheda, Co. Louth, Eire. Graduated Dublin, July 23rd, 1945. Died February 1st, 1953; aged 30 years.

Mr. J. G. Donnelly, whose death at so early an age we record with much regret, practised in partnership with his brother, Mr. Arthur D. Donnelly, M.R.C.V.S. He was the fourth son of the late Mr. Andrew A. Donnelly, M.R.C.V.S.

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THE LATE MR. J. H. SHEPHERD, M.R.C.V.S.

Mr. Joseph Hutchinson Shepherd, of Guildford, whose death was recorded in our issue of January 31st, was born in Hertford. After qualifying, he went to South Africa, where in 1900 he and colleagues tackled the scourge of rinderpest and virtually cleared it from the colony.

Going to Guildford in 1901 Mr. Shepherd was veterinary surgeon under the County Council until 1927, when full-time officers were appointed. He also served the borough for many years.

Mr. Shepherd operated his extensive private practice from 194, High Street, Guildford, where there were veterinary surgeons for practically 130 years.

His wife, daughter of a veterinary surgeon, died in 1929. There are two sons, with whom Mr. Shepherd lived partly in London and partly in Guildford since retiring in 1933.

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IRISH BRANCH OF THE LADIES VETERINARY BENEVOLENT GUILD

DUBLIN STUDENTS' UNION DANCE

Mr. J. D. O'CONNOR, M.R.C.V.S., Hon. Secretary-Hon. Treasurer, Irish Branch of the Ladies' Guild, writes: "A highly successful dance was held recently by the Veterinary College Students' Union in the Mansion House, Dublin, the proceeds of which they have kindly donated to the Irish Branch of the above Guild. The profits of this function amounted to the phenomenal sum of over £100. This is by far the greatest amount ever received from the Dublin students towards this charitable organisation, and the Ladies' Committee of the Guild in Ireland are extremely grateful to the students for this wonderful donation which will add considerably to the total contribution sent from this country to the Central Fund next June."

* * * * *

GREAT DANE WINS AT CRUFT'S

An entry of 12,033, made up by 5,865 dogs from all parts of the British Isles, was received for Cruft's show, which took place at Olympia on Friday and Saturday of last week. Large entries were made by exhibitors from the Home Counties, and there were 370 dogs from London. Yorkshire and Lancashire were well represented, and there were 252 dogs from Wales and 207 from Scotland. There were 2,679 dogs in the hound, terrier, and toy breeds and Pekinese had the highest entry in the toy varieties. The supreme championship of the show was awarded to a magnificent Great Dane, Champion Elch Edler of Ouborough, with Mr. E. Abson's Afghan hound Champion Netheroyd Alibaba as reserve best in show. Winner of the obedience competition was Mr. W. H. Shackleton's working collie Obedience Champion Zena.

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CHAIRMAN OF NATURE CONSERVANCY

The Nature Conservancy announces that the Lord President of the Council, with the concurrence of the Secretary of State for Scotland, has appointed Mr. Arthur Bryce Duncan to be Chairman in succession to Sir Arthur Tansley. Sir Arthur Tansley has been Chairman since the conservancy was established under royal charter in 1949.

Mr. Duncan is Chairman of the Finance Committee and a member of the Scottish Committee. He is well known as a naturalist, being Chairman of the Fair Isle Trust, a past Chairman of the

Scottish Ornithologists' Club, and a member of the Secretary of State for Scotland's Advisory Committee on Wild Birds. He is also a keen entomologist, with a special interest in diptera.

Mr. E. M. Nicholson is Director-General of the Nature Conservancy. He was appointed in August on the retirement of Captain C. R. P. Diver.

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PARROTS AND MISCELLANEOUS BIRDS (PROHIBITION OF IMPORTATION) ORDER, 1953

The Ministry of Agriculture and Fisheries recently announced that following the discovery of two cases of ornithosis amongst domestic poultry and the existence of fowl pest amongst some imported birds of the parrot family, it had been decided to prohibit the importation into Great Britain of all such birds in order to prevent the introduction of these diseases from abroad.

To give effect to this decision the Minister of Agriculture and Fisheries has now made an Order entitled the Parrots and Miscellaneous Birds (Prohibition of Importation) Order, 1953. The Order, which comes into operation on February 16th, 1953, prohibits the importation of birds of the species Psittaciformes, including any of the birds commonly called parrots, parrakeets, budgerigars, lovebirds, macaws, cockatoos, cockatiels, conures, lories and lorikeets, but allows transhipment at a port under licence granted by an officer of the Ministry.

Birds required for medical and veterinary research or by approved zoos may be permitted to enter the country under licence. Importation licences may also be granted for bona fide pets not intended for sale, provided that they are not likely to be brought into contact with poultry and the Ministry is satisfied that there is no danger of disease being spread by the imported bird. Application for these licences should be made to the Ministry at the address given below.

Copies of the Order may be obtained from H.M. Stationery Office or from the Ministry of Agriculture and Fisheries, Hook Rise, Tolworth, Surbiton, Surrey.

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LABORATORY SERVICE FOR GUINEA-PIG BREEDERS

With the assistance of the Public Health Laboratory Service, the Veterinary Investigation Department (Ministry of Agriculture and Fisheries), and veterinary investigation officers in Scotland, the Laboratory Animals Bureau has made arrangements to provide all accredited guinea-pig breeders with a local diagnostic and advisory service. Each breeder is allotted to one, or sometimes more than one, near-by laboratory and instructed to send there for bacteriological examination all his guinea-pigs which die. The laboratory undertakes to examine the dead animals in order to discover the cause of death, to visit the breeder if necessary, and to advise on any prophylactic measures to be taken. The Bureau receives a duplicate laboratory report, and is thus able to take any further steps which may be indicated.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Ayrs.—Farm of Ochiltree Mains, Ochiltree, Cumnock (Feb. 2nd).
Beds.—No. 25 Holding, Land Settlement Association, Potton, Sandy (Feb. 5th); Duck End Farm, Wilstead, Bedford (Feb. 6th).
Cambs.—45, Middleton Way, Fen Drayton, Cambridge (Feb. 2nd).
Ches.—Bank Farm, Duckington, Malpas (Feb. 4th).
Cumberland.—Fairladies Farm, St. Bees (Feb. 4th).
Derbys.—Ferny Dale Farm, Earl Sterndale, Buxton (Feb. 6th).
Devon.—Hatherland Farm, Washfield, Tiverton (Feb. 7th).
Essex.—Whitley's Farm, Birdbrook, Halstead (Feb. 2nd); Terves Farm, Little Sampford, Saffron Walden (Feb. 5th).
Glos.—Valley Farm, Staverton, Cheltenham (Feb. 2nd); Mason's Cottages, Bentham Lane, Witcombe (Feb. 3rd).
Herts.—The Camp Allotments, Windermere Avenue, St. Albans (Feb. 2nd).
Lancs.—Love Clough Fold Farm, Love Clough, Rossendale (Feb. 6th).
Lincs.—Red Roofs, Holbeach, Spalding (Feb. 6th).
Norfolk.—Fern House Farm, Ingham, Norwich; 7, West End, Costessey, Norwich (Feb. 2nd); Brown's Farm, Church Road, Reedham, Norwich (Feb. 7th).
Northants.—Beeches Farm, Little Addington, Kettering (Feb. 4th).
Perths.—Cairnbeddie Farm, St. Martins, Perth (Feb. 5th).
Staffs.—Red Lion Inn, Dayhills, Stone (Feb. 6th).
Yorks.—Granby Farm, Netherton, Huddersfield (Feb. 6th).

SWINE FEVER:

Berks.—Douglas Farm, Hurst, Reading (Feb. 6th).
Ches.—The Fields, Lower Peover, Nr. Knutsford (Jan. 30th); The Piggery, Creekside, Wallasey (Feb. 2nd); 11, Cheshire Street, Audlem, Crewe (Feb. 5th).
Cornwall.—Shuffley, Tolgus, Redruth; Roselidden Farm, Wendron, Helston (Jan. 31st); Trelawney House, Shortlanesend, Truro; Governs Farm, Threemilestone, Truro; Degembris, Newlyn East, Newquay; Higher Crelley, Wendron, Helston (Feb. 2nd); Treviskey, Portloe, Truro (Feb. 3rd); Little Polgrain, Caerhayes, Gorran, Truro; 5, African Row, Baripper, Camborne (Feb. 4th); Sparrey Bottom, Carharrack, Redruth; Carnarthen Moor, Carn Brea, Redruth (Feb. 5th); Mount Ambroso, Redruth (Feb. 6th).
Denbighs.—Plas Llanynys Farm, Llanynys, Ruthin (Feb. 2nd); The Cottage, Garth, Trevor, Wrexham (Feb. 7th).
Essex.—Little Fowlers, Galleys Corner, Cressing, Near Braintree (Jan. 31st); "Little Acres," Bromley Road, Parsons Heath, Colchester (Feb. 3rd); Church Farm, Tendring, Clacton-on-Sea (Feb. 5th); Layer Mills Ltd., Layer-de-la-Haye, Colchester (Feb. 6th).
Flints.—Shotton Hall Farm, Shotton, Near Hawarden (Jan. 31st); Craig Ayn, Penyffordd, Chester (Feb. 3rd).
Glam.—Station Fields, Warm-Wen, Llangeinor, Bridgend (Jan. 30th).
Hants.—Kensington Cottage, Tadley, Basingstoke (Feb. 5th).
Lincs.—Back of 30, Roberts Street, Grimsby (Feb. 6th).
Middlesex.—Braemar Farm, Ruislip (Jan. 31st).
Norfolk.—The Bungalow, Tacolneston, Norwich; Hall Farm, Lynn Road, East Winch, King's Lynn (Feb. 6th).
Notts.—Field Farm, Askham, Newark (Jan. 30th); 2, The Row, Shireoaks, Worksop (Feb. 2nd).
Oxon.—2, Bradley Street, Checkendon, Reading (Feb. 2nd).
Staffs.—Park Hill Farm, Goldthorn, Wolverhampton (Feb. 4th).
Suffolk.—Wistarie House, Brantham, Manningtree; Boyton Hall Farm, Boyton, Woodbridge (Jan. 30th); Hill Farm, Sproughton, Near Ipswich; The Warren, Head Lane, Great Cornard, Sudbury (Jan. 31st); Silver Street Farm, Withensfield, Haverhilly (Feb. 4th); The Grange, Wyverstone, Stowmarket (Feb. 5th); Rookery Farm, Eyke, Woodbridge (Feb. 6th); Jolly Farm, Campsea Ash, Woodbridge (Feb. 7th).
Surrey.—Myrtle Cottage, Moors Lane, Elstead, Godalming (Feb. 6th).
Warwicks.—Village Farm, Meriden, Coventry (Feb. 3rd); Triumph Engineering Co., Birmingham Road, Allesley, Coventry (Feb. 5th); 9, Lily Road, South Yardley, Birmingham (Feb. 7th).
Worcs.—Pound Green Arley, Bewdley (Jan. 31st); The Poplars, Hopwood, Birmingham; Slade Lane Piggeries, Hall Green, Birmingham (Feb. 3rd).
Yorks.—Moorhouse Farm, Badsworth, Pontefract; 449, Manor Lane, Sheffield, 2; Plot 39, Roberts Road Allotments, Balby; "The Firs," Fishlake, Doncaster; Newthorpe Farm, South Milford, Leeds; Ash Tree Cottage, Warthill, York (Feb. 3rd); Eastern Road Piggeries, Boynton, Bridlington; Beech Tree Farm, Flaxton, York (Feb. 5th); The Piggeries, Smithies, Heckmondwike; Squirrel Hall Farm, Staincliffe Road, Dewsbury (Feb. 6th).

FOWL PEST:

Berks.—Brackindale, Nash Grove Lane, Wokingham (Feb. 3rd).
Brecon.—Dwrlodde, Llanbedr, Crickhowell (Feb. 3rd).
Lancs.—Walton's Farm, Chapel Lane, Longton, Preston; Brookfield Farm, Longton, Preston (Feb. 3rd); Farnworth Close Farm, Westhoughton, Bolton (Feb. 4th); Ouzle Hall Farm, Hooley Bridge, Heywood (Feb. 6th).
Norfolk.—Fair View, Cooner Lane, Horsford, Norwich (Feb. 4th).
Notts.—High Westings, Bingham, Nottingham (Feb. 4th).
Yorks.—31, Ferndale Grove, Leeds, 9 (Feb. 6th).

FOOT-AND-MOUTH DISEASE:

Aberdeens.—Bankhead, Fyvie (Feb. 2nd).
Glam.—Tynant Farm, Llantwit Fardre, Pontypridd; West Caerlan Farm, Llantrisant (Feb. 3rd).
Mon.—Pantygoytre Farm, Llanvair Kilgeddin, Abergavenny (Feb. 8th).

HARRY STEELE-BODGER MEMORIAL FUND

Fifth List of Donations

The Appeal Committee again acknowledges with grateful thanks the following further donations to the Fund:—

	£	s.	d.
Total announced on January 31st	2,045	17	10
Mr. K. P. Anderson (Causewayhead)	1	1	0
Messrs. Arnold & Sons	10	10	0
Mr. F. W. Aston (Accra, Gold Coast)	1	1	0
Mr. W. Aucote (Coton, Near Tamworth)	1	1	0
Messrs. Baillière, Tindall & Cox, Ltd.	5	5	0
Professor W. I. B. Beveridge (Cambridge)	3	3	0
Mr. E. Brown (Bath)	1	1	0
Mr. G. K. Buckler (Stevenage)	1	1	0
Centaur Society (University of Bristol Veterinary School)	2	2	0
Mr. H. A. Clay, Mr. K. E. Cabban (Woodbridge) ...	2	2	0
Messrs. Cooper, McDougall & Robertson, Ltd. ...	25	0	0
Mr. E. R. Corrigall (Shrewsbury)	5	5	0
Mr. L. Dougal (Pittenweem)	1	1	0
Mr. K. H. Everett, Miss H. L. Lock (Farnham) ...	2	2	0
Mr. A. A. Forsyth (Calcutta, India)	5	5	0
Mr. J. Gibson, Mr. W. Thomson (Dundee)	2	2	0
Mr. H. W. Griffiths (Moseley)	5	5	0
Mr. P. D. L. Guilbride (Kingston, Jamaica)	5	0	0
Mr. J. K. Hooton and Mr. G. McIlroy (Hailsham) ...	5	5	0
Dr. C. S. M. Hopkirk (Addis Ababa)	2	2	0
Mr. G. B. B. Howat (Halesworth)	1	1	0
Mr. W. K. Hunter (Northampton)	1	0	0
Irish Veterinary Students' Union	10	0	0
Mrs. F. A. Jaques (Birmingham)		10	0
Dr. R. F. Jones (Tamworth)	2	2	0
Mr. W. O. Jones (Bettws-y-Coed)	2	2	0
Lincolnshire & District Division	10	10	0
Mr. H. A. McClelland (Market Drayton)	1	1	0
Mr. D. E. Macgregor (Malya, Tanganyika)	5	5	0
Mr. G. M. Mackay (Forfar)	1	1	0
Mr. P. H. Mercer (Harlaston, Near Tamworth) ...	1	1	0
Mid-West Veterinary Association	10	10	0
Miss J. N. Milnes (Huddersfield)	1	1	0
Mr. A. M. Morrison (Buenos Aires)	1	1	0
Mr. C. T. Murphy (Colchester)	3	3	0
Mr. J. G. Murray (Ledbury)	5	5	0
Major E. Noel (Colchester)	1	0	0
North Wales Division	25	0	0
Mr. A. G. Rae (Boroughbridge)	1	1	0
Mr. R. S. Roberts (Runcorn)	1	1	0
Professor A. Robertson (Edinburgh)	2	2	0
Mr. W. Spare (Wilnacote, Near Tamworth)	1	1	0
Messrs. T. & W. & W. Southall	3	3	0
Mr. J. A. Taylor (Edinburgh)	1	1	0
Mr. R. H. Vale (Stourport-on-Severn)	1	1	0
Messrs. Vann Bros. Ltd.	5	5	0
Veterinary Medical Association of Ireland	26	5	0
Veterinary Staff of Berkhamsted Hill Research Station (Cooper Technical Bureau)	5	5	0
Mr. T. Walker (Tamworth)	1	1	0
Western Counties Veterinary Association	10	10	0
Mr. G. T. Willows (Lymington)	1	1	0
Messrs. Willows, Francis, Pharmaceutical Products, Ltd.	10	10	0
Mr. J. Wilson (Newton Regis, Near Tamworth) ...	½	1	0
Mr. J. C. Wilson (Braunton)	1	1	0
Mr. D. W. Wood (Gloucester)	2	2	0
Total	£2,289	15	10

All donations should be sent to the Hon. Treasurer of the Fund: S. L. Hignett, Steele-Bodger Memorial Fund, 36, Gordon Square, London, W.C.1, and cheques, postal orders, etc., should be made payable to the "Steele-Bodger Memorial Fund."

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IRISH NATIONAL STUD PAYS RECORD PRICE FOR TULYAR

The outstanding Tulyar, last year's Derby winner, has been bought by the Irish National Stud from the Aga Khan for £250,000, a price which is a record for any racehorse or stallion in this country. The Aga Khan is reported to have rejected higher offers from America, including one of £350,000, to keep Tulyar on this side of the Atlantic. He sold three previous Derby winners in the United States.

Tulyar will stand at the Irish National Stud, Tully, in County Kildare, where their other successful stallion, Royal Charger, is installed. Tulyar's future racing career will be decided by the Board later.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

USE OF SILVER DINAPHTHYLMETHANE DISULPHONATE IN ALOPECIA AFFECTING THE EARS OF DACHSHUNDS

Sir,—During my past eight years as veterinary surgeon in charge of some 500 dogs undergoing quarantine I have experienced considerable trouble with dachshunds losing hair from the outer surface of the ear. The condition affects as many as one-third of the smooth-coated dachshunds arriving from abroad and, as may be imagined, the blame for this unsightly appearance frequently is laid at my door. Consequently it has been of some considerable interest to me to find some products which would rapidly stimulate new growth of hair and so relieve alarmed owners. Realising that the condition is frequently met with in general practice I feel that my colleagues may be interested.

A large number of preparations have been tried without reliable results, including iodine in colloidal form and as a penetrating ointment, cod-liver oil, vitamin A injections, B.-Naphthol, etc. Eventually I came upon silver dinaphthylmethane disulphonate (Viacutan) which has given quite striking results. Applied every other day in the form of a 1 per cent. cream this has encouraged new hair to appear in some 10 to 14 days with subsequent rapid covering of the flap and it is now adopted as a routine measure here. Some cases have been more resistant but having treated over 100 cases to date I can say that there has been no failure.

The preparation is also recommended for furunculosis but, at the moment, I have insufficient evidence to give any final opinion on this aspect, although it has given some good results.

The only drawback I can envisage for the cream is that being a silver preparation it will stain any material with which it comes in contact, so that care must be taken in its use.—Yours faithfully, E. W. Fawcus, Hackbridge Kennels, London Road, Hackbridge, Surrey. *January 29th*, 1953.

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PROPOSED AMENDMENTS TO THE PENICILLIN ACT

Sir,—In connection with the announcement of pending legislation to permit of penicillin being released for incorporation with pig food, is it not likely that the free use of this may give rise to some penicillin-resistant strains of *Erysipelothrix rhusiopathiae*?

In this area erysipelas in pigs is very widespread, and at present the prompt use of penicillin gives very good results. I should be sorry to have to revert to the older method of treatment.—Yours faithfully, C. D. James, 54a, Wrawby Street, Brigg, Lincs. *January 31st*, 1953.

* * * * *

Sir,—Having just read the proposed amendments to the Penicillin Act I was wondering if they met with the approval of the veterinary profession. It seems to me that once it becomes permissible for anyone to include penicillin in the dietary of his livestock, there are three possible dangers.

Firstly, it may be imprudent to interfere with the natural, normal growth rate of animals. Furthermore, if it is speeded up it means that new levels of starch, protein and mineral intake will have to be devised to keep up with the new growth rate.

Secondly, in cattle it may possibly result in a change in the microfauna and microflora in the rumen, such a change being implicated in the aetiology of acetonaemia.

Finally, there is a danger of building up penicillin-resistant strains of bacteria among those normally present in various tracts of the animal body, bacteria which were previously penicillin-sensitive and which would set up a diseased condition when the resistance of the animal is lowered. Can we afford to lose penicillin as a line of therapy which has proved to be of such use and so easy of administration?—Yours faithfully, D. A. P. Grattan (Final Year Student), Streatley House, Streatley, Berks. *February 3rd*, 1953.

Advertiser's Announcement

Vetostelin

Glaxo Laboratories Ltd., Greenford, Middlesex, announce the introduction from February 16th of a 30 c.c. rubber-capped bottle of Vetostelin, containing 600,000 units vitamin D per c.c. The new pack is intended for massive vitamin D therapy.

The existing 6 × 1 c.c. pack of Vetostelin will be discontinued as from February 16th.